40 Back (C)

POPULAR Computing WEEKLY

FREE GAMES CASSETTES

35p 29 September-5 October 1983 Vol 2 No 39

This Week

News Desk

Melbourne announces HURG

MELBOURNE House is announcing its *Hi-resolution User-friendly Real-time Games-designer* (HURG) program at the *Personal Computer World* show this week

The package which costs £14 95 and was written by William Tang performs a similar function to Software Studio s *Games Designer (PCW 15 21 September)* *HURG* enables games using a selection of pre determined programming routines

The program which will contain three ready to play games, will be available on the 48K Spectrum in the middle of October Versions for other machines including the

Continued on page 5

Virgin has a change of heart

VIRGIN Games is to change its approach to the software market

According to managing director Nick Alexander, Virgin is in the final stages of setting up an in-house software production facility — similar to the sort of development team used by Psion Ultimate and Melbourne House

At the centre of the new team will be a multi-user mini-computer running advanced program development software capable of emulating the workings of different processors

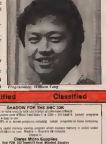
To begin with, three in-house programmers will be appointed — graduates drawn from the computer courses of the country s top universities This number should rise to five by Christmas with the first programs from the team arriving in the shops in early 1984

Says Nick 'It is obviously a colossal investment but it seems that is the way software development is going

'It is a pity, because it means that the days when it will be possible for a single gifted amateur to develop a top selling game are numbered

Since Virgin Games was launched in June the company has built up a range of titles all drawn from enthusiasts who replied to advertisements re-

Continued on page 5

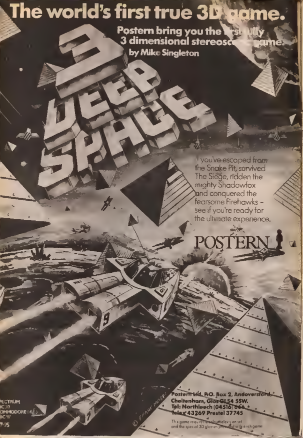


Programmer William Tang

Classified Classified Classified Classified

Continued on page 50

★ ★ BRITAIN'S HOME COMPUTER WEEKLY ★ ★


The world's first true 3D game.
Postern bring you the
3 dimensional stereosc
by Mike Singleton
3 DEEP SPACE
you've escaped from the Snake Pit, survived The Siege, ridden the mighty Shadowfox and conquered the fearsome Firehawks – see if you're ready for the ultimate experience.
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POPULAR Computing WEEKLY

29 September-5 October 1983 Vol 2 No 39 SUNSHINE

The Team

Popular Computing Weekly
12-13 Little Newport Street
London WC2R 3LD
Telephone **01-734 1051**
Published by Sunshine Publications Ltd
Typesetting origination and printing by Chesham Press Chesham Bucks
Distributed by S M Distribution
London SW9 01 274 8611 Telex 261643

ABC
MEMBER OF THE AUDIT BUREAU OF CIRCULATIONS
ISSN 0265 0509

How to submit articles
Articles which are submitted for publication should not be more than 3 000 words long The articles and any accompanying programs should be original It is breaking the law of copyright to copy programs out of other magazines and submit them here — so please do not be tempted

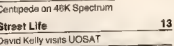
All submissions should be typed and a double space should be left between each line Please leave wide margins.

Programs should whenever possible be computer printed

We cannot guarantee to return every submitted article or program so please keep a copy If you want to have your own program returned you must include a stamped addressed envelope

Accuracy
Popular Computing Weekly cannot accept any responsibility for any errors in programs we publish although we will always try our best to make sure programs work

This Week



Editorial

The computer market is looking, if not shaky, at least uncertain at the moment Following the recent troubles at NewBrain, Dragon and Texas Instruments, comes news of difficulties for Osborne and Apple

However, four home computer manufacturers are planning to expand their activities into the personal business computer area Acorn, Dragon, Oric and Sinclair are all working on business micros for launch at the end of this year or in the first half of 1984

Personal business computers is an area that has been largely ignored up to now Micros have tended to fall into one of two categories — home (ie, cheap and 'non serious') or business ie, expensive and 'serious') Despite the efforts of firms like Camputers, there has been little crossover between the two sectors of the market

But, the new IBM Peanut would appear to be aimed straight between these two traditional 'breeds of micro Details of the Peanut are scarce, but it seems to be capable of fulfilling a dual/home business role

Whether Acorn, Dragon, Oric and Sinclair will be successful with their new machines remains to be seen. But, the fact that IBM appears to be following similar lines must be encouraging

Next Thursday

Try and ram the saucers and aliens with your shuttlecraft, but avoid the asteroids. Asteroid Dodge — next week s star game for the BBC B by Phillip Wells

Virgin software

Continued from page 1

questing programs This approach has met with mixed success — the company has gained a name for BBC software while Nick admits some of the Spectrum titles have not sold well



Nick Alexander

Virgin plans more releases from its roster of freelance programmers in the coming months October will see two Commodore 64 titles — *Falcon Patrol* and *Bitmania* four Spectrum 48K programs — *Quetzalcoatl*, *Robber Lost* and *Spectrum*, four for the BBC — *Microbe*, *Chieftain*, *'Owzat* and *Trench*, and two for the TI99/4A — *Robopods* and *Fun-Pac* This will be followed in November by four more for the Spectrum, three more for the BBC and one for the Dragon

Virgin has also dropped its prices As from its September releases Spectrum and Vic prices come down to £5 95, and Dragon and Oric tapes come down to £6 95 BBC titles stay at £7 95

HURG

Continued from page 1

Commodore 64 and BBC B will follow shortly

Games written with *HURG* will be eligible for a £3 000 competition Each month, until January 1984 prizes will be awarded to the three best games written with the aid of *HURG* The overall winner will then be awarded the £3,000 grand prize Details of the competition will be included with each copy of the program

Made in UK

AS predicted (*PCW*, September 1) Acorn has announced a deal with AB Electronics to manufacture 100 000 Electron machines in the UK

Commodore try to halt trend

HAVING been partly responsible for the recent micro price war Commodore is now apperently trying to halt the trend, by encouraging dealers to keep prices up

One retailer upset by Commodore's actions is Mike Mehdi of Crestmatt who has reported Commodore to the Office of Fair Trading

Crestmatt is currently selling the Commodore 64 machine £4 under a suggested minimum price of £199 95 He alleges that Commodore has threatened to cut off his supply of machines if he doesn't raise his prices

He also claims that Commodore will only grant him a dealership if he discloses the name of the company supplying him with machines

Mike says "The only way we can compete with the high street stores is on price by cutting our own profit margins"

Commodore on the other hand, denies that any attempts are being made to impose a £199 95 price for the Commodore 64 model

A spokesman commented 'We have no quarrel with Crestmatt — it is the person he is buying from we are concerned about It is conditional on our supplying people that they adhere to our terms of business '

Mike Mehdi is determined not to disclose the source of his Commodore 64 supply "I have now dropped the price of the Commodore 64 to £164 95 and will be holding it at that level up to the new year"

Hitch for Aquarius

MATTEL Inc's announcement of huge financial losses has cast doubt over the future of the Aquarius computer, recently launched in this country

The company recently announced financial losses of $156 1m for the quarter to July 30 The blame for the fall was put on the company's electronic division — experiencing a slump in American video game and computer sales — which lost $166 7m for the quarter

Mattel reacted by announcing 'sharply' reduced marketing of its Aquarius home computer in the US This means that the Aquarius will not now achieve full national distribution in the States

This in turn has cast doubts over the computer's future in the UK Mattel UK's managing director Mike Lunch was anxious to dispel any fears for the Aquarius in the UK 'I think the worry is misplaced," he said

He explained that Mattel has sold marketing rights for the Aquarius in non-English-speaking countries to the machine's Far Eastern manufacturers, Radofin

Lynx triplets

CAMPUTERS' 96K Lynx computer is now available, priced at £299 The new machine offers 37 5K of user-Ram in Basic and high-resolution colour This compares with the 48K Lynx's 13 7K The 96K also features additional Rom commands contained in a 4K extension Eprom These include printer joystick and light-pen commands, as well as *Circle*, *Triangle* and *Rectangle Fill* graphics commands

Owners of 48K machines will be able to up-grade to the 96K for £89 95

Next week's *Personal Computer World Show* will see the launch of the Lynx disc drive system A single 5¼in single-sided double density 40-track Alps unit plus Lynx operating system will cost £343 85

Camputers also hopes to preview its 128K machine with Lynx facilities disc and CP/M at the show

Apple down

SHARES of Apple Computers fell by 25 percent on the New York stock exchange on Friday, September 23 after the company announced that fourth quarter profits would be "sharply" down

Autumn releases from Thorn

COMPUTER WAR heads up Thorn EMI's autumn software releases — based on the hit movie *War Games*

The title will be out on cartridge in October for the Vic20 (£19 95), Atari and Texas machines (both £29 95)



Other cartridge releases next month include *Mine Madness* for the Vic20 (£19 95) and *Carnival Massacre* for the Atari (£24 95)

In November, Thorn EMI will produce its first games on cassette for the Spectrum No prices are available yet but the titles are *Volcanic Planet*, *Gold Rush* and *Blockade Runner* for the 16K model and a version of *River Rescue* for the 48K

Quicksilva's Christmas list

QUICKSILVA has announced its new titles for Christmas

Four for the Spectrum *Soft Solid 3D Ant Attack* (48K) and *The Flea*, *Gridrunner* and *Traxx* (the latter two by Jeff Minter in conjunction with Salamander) (all 16K)

Two for the BBC *The Generators* (a utility program) and *Mined Out*

Four for the Commodore 64 *Purple Turtles*, *Aquaplane*, *Ring of Power* (an adventure) and *Quintic Warrior*

At the Barbican

POPULAR Computing Weekly will be on stand number 444 at this week's Personal Computer World Show at the Barbican London


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Address

LETTERS

World champion?

Ok you guys. So you think you're good! I challenge you to beat my friend David Willmer's score of 169 990 on Interceptor Micro's *Frogger*. Beat that if you can — it took David 40 minutes using my Commodore 64. Is David the World Champion?

Julian Courtland Smith
Atlantis
28 Tile Kiln Lane
Hastings
East Sussex TN35 5EN

Adventure helpline

In response to Stephen Renton's letter (Vol 2 No 36). I heartily endorse his suggestion for a machine code helpline and/or a machine code pen pal section, but cannot agree with his views on the adventure corner helpline, though a bit more solid info and a little less in comments or asides would be appreciated.

I'd also like to back up Mark Fussell and others in requesting a return to a m/c series for the 48K Spectrum and agree with his reasons for buying your magazine.

The problem with all the m/code articles — and books which I have read — is that there always seems to be a vast gap between a very beginners please type "don't forget to press enter" — and the heady heights (to me) of vast strings of numbers without practical information on how to use them.

R B Mote
1 Barmouth Avenue
Perivale
Greenford
Middlesex UB6 8JR

Captain Red Ken

Skipping all the 'your magazine is great, please print my letter' trash, I will get straight to the point.

I have decided to go into the software business. As I don't consider myself a second Jeff Minter, I am in need of help.

I would be very grateful if Vic20 owners with programs they consider to be commercially viable would send them to me. This will be run under 16s outfit with 50 percent royalties. It doesn't matter if your programs aren't in the *Astron Belt* class, there are such things as gamestapes.

I would also like to know your advertisement rates as if I ever get this off the ground yours is a magazine in which I would like to advertise.

Finally, Rabbit Software's *Myriad* holds no further mysteries — I have scored 1,125 000 plus, going round two times and finishing with 30 lives and something in the region of 100 shields. This I must point out, was achieved on a tape supplied free of charge by Rabbit when I told them mine was faulty.

Captain Red Ken
42 Freshfield Road
Formby L37 3HW

PS. If anyone submitting tapes wants them back, please include a SAE.

Well, Captain Red Ken, I don't know how many of our readers will want to take up your offer, but it seems only fair to give them an opportunity to do so. Our advertising department will be happy to send you a copy of our rates.

Wrongly numbered

Regarding the extremely useful article and program on word processor for Spectrum 48K (*PCW* 15-21 September page 20) the hex-loader (incorrectly numbered program 2) will not run as listed. I suggest the following lines will do the trick.

```
31 IF LEN X $/2<>INT(LEN X $/2)
   THEN PRINT "INCORRECT EN
   TRY": GOTO 30
45 LET X$ = X$ (3 TO)
```

D Warner
29 Heath Farm Road
Ferndown
Dorset

Apologies to anyone who tried to enter Dale McLoughlin's word peocessing listing and failed. Programs one and two were numbered the wrong way round.

Sinclair user group

We have noticed recently in several of the computer magazines letters claiming that there is a shortage of user groups for Sinclair users. Apparently these users are not aware of our own group which has members around the world.

The International Sinclair User Group (ISUG) was formed as a result of the demise of the former, well-respected National ZX User Group, organised by Tim Hartnell.

We would be grateful for a plug on your letters page and club file to dispel this nasty rumour that Sinclair users are without representation. All that is needed is a letter to us at the above address, a stamp for the reply would be appreciated (not an SAE), this will bring full details plus an application form.

We welcome applications from both seasoned veterans and newcomers alike, so let's hear no more nasty talk about non-representation.

Peter Paton and Vic Webber
ISUG
176 Todmorden Road
Burnley
Lancs

It's good to see someone attempting to fill the gap left by the closure of the National ZX User Group. ISUG has our best wishes for the future.

Conditional statement

I found J Coote's *Turtle* interpreter for the ZX Spectrum in a back issue of *PCW* (Vol 2 No 30). I have implemented it and had a lot of fun with it.

The author asked for suggested additions. One that I have made is "a conditional statement".

The most natural syntax for such a statement would be "*if cond do S1 else S2 then* ...", meaning that the numerical expression *cond* is evaluated, the program executes *S1* or *S2*, depending on the value of *cond*, with program execution continuing after *then*. However, it simplifies the programming to use the form "*if cond (S1) (S2)* ..." since there is already a subroutine to locate bracketed substrings for the '*rep*' command. The relevant additions are:

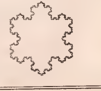
```
329  IF T$ = "if" THEN GOTO 1500
1500 GOSUB 40: GOSUB 45: LET
     cond = VAL Z$ (i + 1 TO f - 1):
     LET P$ = Z$ (i + 1 TO e - 1):
     LET Z$ = "X" + Z$ (e + 1 TO)
1510 GOSUB 45: LET Q$ = Z$ (i + 1
     TO e - 1): LET Z$ = "X" + Z$
     (e + 1 TO)
1520 IF cond THEN LET Z$ = "X" +
     P$ + Z$ (Z TO): GOTO 100
1520 LET Z$ = "X" + Q$ + Z$ (Z
     TO): GOTO 100
```

The *Turtle* accepts recursive calls to object definitions — with "*if*" we can ensure that the recursion "bottoms out" and thus draw famous recursive pictures like the snowflake and dragon curves.

Of course, recursion raises the vexed question of local variables. In this case, the only *Turtle* variable is '*siz*'. For most purposes, it is sufficient to ensure that, whenever a definition is called recursively, the value of '*siz*' on leaving is returned to its value on entering. Thus, the following lines define the snowflake curve:

```
obj side if siz<3 (drw siz) (siz siz/3 side
   tur 60 side tur-120   side tur 60
side siz siz * 3)
obj snowflake rep 3 (side tur 120)
```

Peter Cameron
70 Godstow Rd
Wolvercote
Oxford OX2 8NY



Centipede

A new game for 48K Spectrum by Jim Provan

This is a version of the arcade game *Centipede*. The object is to shoot all the bugs which attack you.

The different creatures and their characteristics are listed below.

1. The *Centipede*. This is the long, snake-like creature which runs across the screen. 500 points are awarded if you hit the body, 1,500 if you hit the head.

2. The Spider. the spider is the yellow creature which bounces around the lower half of the screen. It is worth 300, 600 and 900 points depending how high up it is when hit.

3. The Flea. The flea is the green bug which drops straight down the screen. When hit it does not stop, but keeps on coming until it reaches the bottom. It is worth 500 points each time it is hit.

4. The Wasp. The wasp is a red creature which 'homes in' on your base. It is worth 1,000 points when hit.

Also present are mushrooms. These appear at random, either half or whole. The bottom scores 50, the top scores 100. BEWARE on hitting the top of a mushroom it is turned into a rock. If this is hit, you lose 1,000 points.

An extra base is awarded every 20,000 points. You initially begin with three. A$ in line 9500 should be typed in as "!@%&— ↑£1 []" (or any twelve symbols you do not need). ■




```
   1 BORDER 0: PAPER 0: INK 7: C
LS : CLEAR VAL "31530": GO SUB V
AL "9500": CLEAR VAL "64999": GO
 SUB VAL "9000": DIM e(10): FOR
x=2 TO 10: LET e(x)=PI-PI: NEXT
x: LET e(1)=PI/PI
   2 RESTORE 3: FOR n=1 TO 17: R
EAD a,b: BEEP a,b: NEXT n
   3 DATA .5,15,.2,15,.2,0,.2,15
,1,10,.5,20,.5,15,1,0,.5,15,.2,1
5,.2,0,.2,15,1,15,.5,24,2,0,.2,2
2,1,22
   4 DEF FN p(y,x)=CODE SCREEN$
(y,x)
   5 CLS : GO TO VAL "8500"
  10 LET k$=INKEY$
  11 IF INT (score/20000)+1>10 T
HEN GO TO 15
  12 IF e(INT (score/20000)+1)=P
I-PI THEN LET lives=lives+PI/PI:
 FOR n=1 TO 5: BEEP .1,30: NEXT
n: LET e(INT (score/20000)+1)=PI
/PI
  15 IF score<0 THEN LET score=P
I-PI
  16 IF score>VAL "999999" THEN
LET score=PI-PI
  17 LET s$=STR$ score
  18 PRINT #0;AT 1,0;("0" AND sc
ore<100000)+("0" AND score<1000
0)+("0" AND score<1000)+("0" AND
 score<100)+("0" AND score<10);
INVERSE 1;s$
  19 PRINT #0;AT 1,10+(20-lives-
1);h$( TO lives-1)
  20 IF k$=l$ AND pos>0 THEN LET
 pos=pos-1
  30 IF k$=r$ AND pos<31 THEN LE
T pos=pos+1
  40 IF k$=f$ THEN GO SUB 100
  50 IF k$=l$ THEN PRINT AT 21,p
os+1;" "
  60 IF k$=r$ THEN PRINT AT 21,p
os-1;" "
  70 PRINT AT 21,pos;"▲"
  75 IF FN p(20,pos)<>32 THEN GO
 TO 4000
  77 GO SUB VAL "1000"
  80 GO TO 10
 100 FOR x=3 TO 1 STEP -1: BEEP
.01,x: NEXT x
 101 FOR d=20 TO 1 STEP -1
 103 PRINT AT d,pos;"↑"
 105 IF FN p(d-1,pos)=32 THEN GO
 TO 140
 190 IF FN p(d-1,pos)=64 THEN LE
T score=score+50
```



```
 100 IF FN p(d-1,pos)=33 THEN LE
T score=score+100
 109 IF FN p(d-1,pos)=95 THEN LE
T score=score-VAL "1000": PRINT
AT d,pos;" ";AT d-1,pos;" ": BEE
P .1,-20: RETURN
 110 IF FN p(d-1,pos)=96 THEN LE
T score=score+(300 AND n<10)+(50
0 AND n=15)+(900 AND n=16)
 115 IF FN p(d-1,pos)=94 THEN LE
T score=score+1000
 120 IF FN p(d-1,pos)=120 THEN L
ET score=score+500: PRINT AT d-1
,pos;" ": GO TO 2598
 125 IF FN p(d-1,pos)=38 THEN LE
T score=score+500: PRINT AT n,u;
" ";AT d,pos;" ": BEEP .1,20:
 GO TO 10
 130 IF FN p(d-1,pos)=38 THEN LE
T score=score+1500: PRINT AT n,u
;" ";AT d,pos;" ": BEEP .1,2
0: GO TO 10
 140 PRINT AT d,pos;" "
 150 IF FN p(d-1,pos)=33 THEN PR
INT AT d-1,pos;" ": BEEP .1,20:
RETURN
 156 IF FN p(d-1,pos)=64 THEN BE
EP .1,20: PRINT AT d-1,pos;" ";A
T d,pos;" ": RETURN
 160 IF FN p(d-1,pos)<>32 THEN P
RINT AT d-1,pos;" ": BEEP .1,20:
 GO TO 10
 165 NEXT d
 170 RETURN
 999 GO TO 999
1000 LET k$=INKEY$
1002 IF k$=r$ AND pos<31 THEN LE
T pos=pos+1
1003 IF k$=l$ AND pos>0 THEN LET
 pos=pos-1
1040 IF k$=f$ THEN GO SUB 100
1050 IF k$=l$ THEN PRINT AT 21,p
os+1;" "
1060 IF k$=r$ THEN PRINT AT 21,p
os-1;" "
1070 PRINT AT 21,pos;"♠"
1080 IF FN p(20,pos)<>32 THEN GO
 TO 4000
1090 LET b=INT (RND*32)
1092 LET c=INT (RND*22)
1100 IF c=21 THEN GO SUB 3000
1105 IF c=20 THEN GO SUB 3500
1106 LET u=INT (RND*32)
1107 IF c=19 THEN GO SUB 2500
1108 IF c=16 THEN GO SUB 1500
1109 IF RND<.28 THEN RETURN
1110 IF c>16 THEN LET c=INT (RND
*10)
1115 PRINT AT c,b; INK 3;"@"
1120 IF RND>.5 THEN PRINT AT c+1
,b; INK 3;"X"
1126 PRINT AT 21,pos;"♠"
1127 LET x=INT (RND*32)
1499 RETURN
1500 FOR n=0 TO 21
1510 LET k$=INKEY$
1520 IF k$=l$ AND pos>0 THEN LET
 pos=pos-1
1530 IF k$=r$ AND pos<31 THEN LE
T pos=pos+1
1540 IF k$=l$ THEN PRINT AT 21,p
os+1;" "
1550 IF k$=r$ THEN PRINT AT 21,p
os-1;" "
1560 IF pos>u THEN LET u=u+1
1565 IF pos<u THEN LET u=u-1
1570 PRINT AT n,u; INK 2;"♦"
1573 BEEP .005,n
1580 IF FN p(20,pos)<>32 THEN GO
 TO 4000
1585 IF k$=f$ THEN GO SUB 100
1590 PRINT AT 21,pos;"♠"
1592 IF n=21 THEN PRINT AT 21,u;
" ": GO TO 1999
1595 PRINT AT n,u;" "
1598 NEXT n
1999 RETURN
2500 FOR n=0 TO 20
2505 LET k$=INKEY$
2510 IF k$=l$ AND pos>0 THEN LET
 pos=pos-1
2520 IF k$=r$ AND pos<31 THEN LE
T pos=pos+1
2550 IF k$=l$ THEN PRINT AT 21,p
os+1;" "
2560 IF k$=r$ THEN PRINT AT 21,p
os-1;" "
2564 LET s$=STR$ score
2565 PRINT #0;AT 1,0;("▓" AND sc
ore<100000)+("▓" AND score<1000
0)+("▓" AND score<1000)+("▓" AND
 score<100)+("▓" AND score<10);
INVERSE 1;s$
2570 PRINT AT n,u; INK 4;"♠"
2571 BEEP .008,n
2573 IF FN p(20,pos)<>32 THEN GO
 TO 4000
2580 IF k$=f$ THEN GO SUB 100
2584 IF n=21 THEN GO TO 2500
2590 PRINT AT 21,pos;"♠";AT n,u;
" "
2595 NEXT n
2598 PRINT AT n,u;" "
2899 RETURN
3000 LET c=1: LET n=INT (RND*20)
3010 FOR u=0 TO 27
3020 LET k$=INKEY$
3030 IF k$=l$ AND pos>0 THEN LET
 pos=pos-1
3040 IF k$=r$ AND pos<31 THEN LE
T pos=pos+1
3050 IF k$=l$ THEN PRINT AT 21,p
os+1;" "
3060 IF k$=r$ THEN PRINT AT 21,p
os-1;" "
3065 IF k$=f$ THEN GO SUB 100
3070 PRINT AT n,u;" "; INK 1;"▓▓
▓"; INK 5;"K"
3075 BEEP .01,10: BEEP .01,0
3080 PRINT AT 21,pos;"♠"
3090 NEXT u
3095 PRINT AT n,u;"    "
3100 RETURN
3500 LET su=INT (RND*2): LET a=-
1: LET n=17: LET u=0
3510 LET k$=INKEY$
3520 IF k$=l$ AND pos>0 THEN LET
 pos=pos-1
3530 IF k$=r$ AND pos<31 THEN LE
T pos=pos+1
3540 IF k$=l$ THEN PRINT AT 21,p
os+1;" "
3550 IF k$=r$ THEN PRINT AT 21,p
os-1;" "
3560 PRINT AT n,u; INK 6;"X";AT
21,pos; INK 7;"♠"
3563 BEEP .01,n
3570 IF FN p(20,pos)<>32 THEN GO
 TO 4000
3573 IF k$=f$ THEN GO SUB 100
3578 IF n=16 OR n=20 OR RND>.8 T
HEN LET a=-a: LET su=INT (RND*2)
3580 PRINT AT n,u;" ": LET n=n+a
3585 LET u=u+su
3590 IF u=31 THEN RETURN
3600 GO TO 3510
4000 PRINT AT 21,pos;"X";AT 20,p
os;" "
4005 FOR x=0 TO 8: BEEP .1,x: BE
EP .1,x+1: BEEP .1,x+2: NEXT x
4010 LET lives=lives-1
4015 IF lives=0 THEN PRINT AT 10
,11; FLASH 1;"GAME OVER": IF INK
EY$="" THEN GO TO 4015
4017 IF lives=0 THEN CLS : GO TO
 2
4020 CLS : GO SUB 8700: GO TO 10
8500 LET score=0: LET lives=3: L
ET h$="♠♠♠♠♠♠♠♠♠♠♠♠♠♠♠♠♠♠♠♠♠♠": LE
T pos=15
8700 FOR n=1 TO 10
8710 LET x=INT (RND*32): LET y=I
NT (RND*18): IF FN p(y,x)<>32 TH
EN GO TO 8710
8716 IF FN p(y+1,x)<>32 THEN GO
TO 8710
8720 PRINT AT y,x; INK 3;"@";AT
y+1,x; INK 3;"X"
8730 NEXT n
8998 GO TO 10
9000 LET a$="       ♠♠♠♠♠♠♠CENTEPO
E♠♠♠♠♠♠♠K"
9010 FOR n=32 TO 1 STEP -1: PRIN
T AT 0,0;a$(n TO ): BEEP .28,0:
NEXT n
9020 PRINT AT 3,0;"LEFT";" z";AT
5,0;"RIGHT";" x";AT 7,0;"FIRE";" S
PACE"
9030 LET l$="z": LET r$="x": LET
 f$=" "
9050 FOR n=32 TO 1 STEP -1: PRIN
T AT 0,32-n;a$( TO n): BEEP .25,
0: NEXT n
9060 CLS : PRINT AT 11,0; INK 1;
 PAPER 6; FLASH 1;"PREPARE FOR B
ATTLE"
9496 RETURN
9500 RESTORE VAL "9520": FOR a=0
 TO 25*13-1: POKE a+VAL "31831",
PEEK (a+VAL "15616"): NEXT a: PO
KE VAL "23606",87: POKE VAL "236
07",123: LET a$="@X♠♠K♠X+R♠IX"
9510 FOR n=1 TO LEN a$: FOR a=0
TO 7: READ b: POKE 31831+8*(CODE
 a$(n)-32)+a,b: NEXT a: NEXT n
9516 RETURN
9520 DATA 0,30,63,45,63,53,43,33
9530 DATA 51,18,22,18,22,26,18,3
3
9540 DATA 12,12,30,63,63,63,30,3
0
9550 DATA 30,63,63,63,63,63,63,3
0
9560 DATA 1,61,56,60,54,61,1,0
9570 DATA 4,38,63,62,62,58,54,0
9580 DATA 33,51,12,18,30,45,33,0
9590 DATA 8,8,8,127,62,8,28,8
9600 DATA 120,166,254,254,124,68
,42,41
9610 DATA 0,0,12,30,53,63,30,12
9620 DATA 12,30,63,12,12,12,30,1
2
9630 DATA 33,18,12,29,48,12,18,3
3
9999 LPRINT
```

CENTIFEDE

Roger — ground control

***David Kelly** talks to Roger Peel about the UOSAT project*

It is now beginning to look as though Britain won t get its first satellite tv networks running by 1985 as originally hoped

No standards for direct broadcast television have yet been adopted, mainly due to internal wrangling within the various European countries Consequently, no one is particularly keen, apart from the French, on going it alone

In the United States the situation is a little different Rupert Murdoch plans to start his New America satellite channel for 1984 while Home Box Office — a film channel — has already proved a runaway success

Satellites everyone is convinced, are going to become very important Not just for broadcasting tv but also for interactive communication, telebanking, armchair selling and all the other things that home computers will make possible

Putting up a satellite is an expensive business To get a complex direct broadcast satellite up there is going to set you back at least £20m

Although communication with the bigger satellites will be strictly controlled, it is possible for any interested person to get in touch with one of the amateur satellites

Amateur satellites, of which there have been 16 so far send out signals which can be picked up by any radio amateur

One such orbiting radio beacon is UOSAT This satellite — standing about three feet tall — was launched as a secondary payload on a Nasa Delta launcher in October 1981 It cost Surrey University a mere £120 000 — as an educational craft it was launched free of charge



Roger Peel is one of the ground support team for UOSAT He explains "The time from beginning work on the project to its launch was only 2½ years — very tight in space terms

The core of UOSAT is a computer, of course But not quite the megabyte marvel one imagines a satellite ought to possess UOSAT contains only two small processors an RCA 1802 and a Ferranti F100L, and 16K of memory

The main use of the computer is for data storage Information on say the strength of the earth's magnetic field, is collected by the computer and then broadcast in fairly concentrated bursts

The data is comparatively simple to decode — being an amateur radio satellite In fact it is the first satellite ever to contain a simple speech synthesiser Data transmitted on some weekends is sent as 'spoken' data

"We only 'see' the craft for 15 minutes six times a day — when I say see, I mean see its radio transmissions I don t know of anyone who has actually seen it It s very small

"The computer can store information from one orbit and transmit it in sections for the next 10 hours — giving us information about the field strength and radiation count

Roger is responsible for writing almost all of the computer s software To save space — 16K is not much — programs are written in assembler code For every new program up-loaded to the craft for a new experiment, a whole suite of programs has to be written for the ground-station to handle the data transmitted back

"Each program has to be very thoroughly tested to be as bug-free as we can make it," says Roger The university uses a duplicate of the spacecraft s computer on the ground to test programs before they are up-loaded

"For writing programs 16K has not proved to be that much of a problem — 16K of assembler program takes quite a lot of writing

"But for data storage, 16K is quite a serious restriction Obviously, we do as much as we can to store things as economically as possible, but there is a limit to how far you can compress the information — for experimental data there is a lot less opportunity for compression than in English text, for example

UOSAT is fairly densely packed compared with a commercial craft It also has none of the elaborate stabilisation mechanisms — spinning gyros and gas jets — needed to keep a broadcast satellite pointing always at the same point on the globe

"It is an amateur satellite — not in the same league as the Voyager series, for example, which are orders of magnitude bigger UOSAT weights about 60kg Many large communications satellites could



weigh about the same as a car

UOSAT is only a broadcast satellite It does not 'transpond' In space jargon, there are no publicly available up-lines Only UOSAT control can send information and new software programs up to load into the on-board computer

UOSAT transmits on 145 825 MHz and the signals can be picked up by an ordinary narrow-band fm hand held receiver with a whip antenna — typically costing around £50

"Listen on that frequency and you will hear the tones (called telemetry) — often at the weekends we use the on board Digitalker to speak the data

The ordinary telemetry signal can be decoded quite simply A very crude device can be made for about £7 from about three integrated circuits A design for one such circuit appeared in the May 1983 issue of *Wireless World*

Basic information on orbital patterns is given on an answerphone service on Guildford 61202 and an accompanying computer program was printed in *Popular Computing Weekly*, April 21 A news sheet, giving more details of how to get data down from UOSAT and analyse it, is available — if you send a stamped addressed envelope — from the Department of Electronic and Electrical Engineering University of Surrey, Guildford

The data sent back from the satellite — the basic telemetry frame — contains 45 status numbers which show what equipment is turned on or off There are also 60 analogue channels which give information on temperature, rotation radiation count and magnetic field strength

All of this information can be collected by any amateur with an appropriate receiver and decoder

It is possible to see how the radiation count varies over the earth s poles or how the battery voltage is affected by sunlight on the craft s solar panels

Anyone wanting to experiment by taking data off the spacecraft should think about doing it reasonably soon though Says Roger "All orbits decay — the craft gets pulled down towards the earth — and one can never be certain but we reckon that UOSAT has only an orbital lifetime of about another three years

"Then the craft will re enter and burn up in the earth s atmosphere ■

Games unlimited

***Mike Grace** attacks the mutant camels in a round-up of games software for the Commodore 64*

If you went to the Commodore Show in June you must have seen a revolution in graphics for games of the future, and if the press releases are to be believed (which most of us find trouble in doing!) then it'll be in the not-too-distant future as well. I'm talking about a football game which has out-of-this world graphics — green field, terrific depiction of the players, crowds, etc. The game looks just like a cartoon — not a typical high-resolution picture. But if you think that's good — then another demonstration on the Audiogenic Stand of a game called *Alice in Wonderland* puts even Commodore's efforts in the shade when it comes to graphics.

The fact that many of the Vic20 games are now coming out on the 64 (and vice versa) convinced me that I ought to concentrate more on the 64 this time around. But don't worry, Vic owners — I still have my faithful Vic to keep bashing away at the new releases.

Let's start with a couple of games from a company new to me, Postern Limited, who call their range of software Imagination Unlimited. The two games are called *Snake Pit* and *Shadowfax* and are available on cassette (at £7.99) and — hooray, hooray — on disk (at £9.99). I had the cassettes to review, and they were packaged in a largish box (as in Rabbit and some Commodore cassettes) — but unlike others I've seen at least Postern retained the cassette box for you to keep the tape in (in a cassette rack if you own one). The artwork for both games was a little amateurish, but the instruction sheet on the reverse of the covers is excellent.

I loaded *Snake Pit* first into the 64. After a short loading time the screen filled with little green dots (eggs!) and small neatly placed rectangles containing writhing snakes which were trapped inside their little rectangle. On closer examination one of the little eggs was seen to be a grinning face with a mouth that kept opening and closing reminiscent of a goldfish (the gobbler!). The idea of the game is for the gobbler to eat all the eggs up (Pacman-style) before a snake eats *him* up. As the eggs surrounding one of the trapped snakes are removed so it can escape, chase and eat up the gobbler.

Obviously the more eggs the gobbler eats the higher the chance of being eaten himself — and just to keep him alert there is a nasty red snake who is also going around eating all the eggs, thereby releasing the other snakes as well. If you do survive to eat all the eggs then you enter phase 2, where the gobbler can now eat up the snakes (tail first, I might add).

So how did I rate it? Well, the first problem was the gobbler was rather slow (as the game is machine code I assume this is intentional), but I wanted him to get on and eat up the eggs faster. Secondly it is quite a hard game as the snakes are soon writhing around all over the place, so a little trick I tried was not to move the gobbler straight away, but allow the red snake to eat up a lot of eggs first.

The game was quite nicely presented, the graphics were adequate (I've been spoilt by *Alice in Wonderland*) and it wasn't *too* hard to play. A sort of blend of Pacman and Serpentine, I suppose. It struck me as being of good value at £7.99.



Judging by the success of *The Hobbit* for the Spectrum, I should think more computer enthusiasts at least know about Tolkien's Lord of the Rings, even if they haven't read it. Well, *Shadowfax* is taken from the book, and is the sequence where Gandalf (alone in the computer game) is riding his horse Shadowfax against the Black Riders of Sauron, armed with only his wits and a handy supply of thunderbolts. At last I saw a beginning to some of the extra capabilities of the 64, for in this game the borders of the screen have trees lining the path which it is possible to ride behind (here we witness the sprite capabilities of the 64 in action) and the graphics really capture some of the feeling of both the book.

Gandalf (all in white) gallops his horse from right to left whilst a horde of Black Riders gallop towards him. One touch of any part of an enemy horse or rider will kill Gandalf (no extra lives in this game) so he must either dodge the enemy by moving the joystick up or down (no sideways movement is necessary as the background moves along at quite a pace simulating the horses movement) or destroy the rider with a thunderbolt.

The game is good, compulsive and quite difficult. If you do manage to keep alive, you then meet the purple-coloured Sauron (I assume) and that's a whole new ball-game, but I won't spoil it for those dedicated enough to get there. The graphics are the best I've seen in the games I've reviewed for the 64 (and the Vic), and a soundtrack of galloping hooves (extremely effective) plus quite good zapping thunderbolts makes this my favourite game of the bunch. I'd say £7.99 is a good price for value. A final word of warning about this game — watch out when the thunderbolt makes a zooming noise!

Not so long ago there seemed to be only one game available for the 64 — a game with the most convoluted title. I'm talking, of course, about *Attack of the Mutant Camels* from Llamasoft. On cassette this game comes with fairly average packaging and is described as a 'hyperfast blast for Commodore 64' (*not* my words, I assure you) and gives you 31 levels of skill! I find it pretty difficult playing most games on Level 1 — the thought of 31 levels is pretty 'awesome' (to use another Llamasoft phrase) but it's sensible and satisfying to see programmers building playing-extension time into their games.

There is the usual loading time (the screen blacks out, then the logo AMC (Attack of Mutant Camels) appears, plus a series of options which you can control with the Function keys. Possibilities include one or two players, where you wish to start, and whether you want to have a collision option.

On to the game itself. It seems some aliens have taken off our camels and mutated them into 90-foot walking laser-spitting death beasts, so we have to pilot our little spacer and kill them off (Luke Skywalker style as in Empire Strikes Back against the Walkers). It's a sort of *Skramble* with camels to attack instead of enemy fighters, and to make it harder the camels aren't killed in one blow, but need several shots (during which they change colour with added realism). Along the top of the screen is a score plus a section telling you how many camels you have to beat and where you are in relation to them.

The game is noisy and fast (as are many of Jeff Minter's games) and although the camel graphics lack a little in sophistication they are good enough. As most of the time you are dodging the laser bolts that the camels spit at you, there isn't really time to appreciate the finer points of the graphics anyway. It's another difficult game and even on the simplest level lots of skill is needed to weaken the camels enough to destroy them before you're blown to smithereens. At £8.50 it is good value and should keep dedicated gamesters going for quite a long time.

Star Trek is an old favourite with games players, or at least with games software houses. In case anyone is still out there who doesn't know how to play it — a brief



resume. You are in control of the Starship Enterprise (going boldly where no man has gone before) and looking for the Klingons in space. You have various screens to help you (a Galactic Map which tells you where you are in space), a Sector Map (which tells you what is in your sector of space) and the ability to warp into another Sector and do battle with the Klingons. During the battle you may be damaged and so find your ship unable to fire torpedo bolts or phasers, or even to warp away to safety. Usually you also have Star Bases where you can refuel and restock. If you do not destroy all the Klingons — you're doomed!

I have always found this game enjoyable, so it was with a hope of increased facilities that I loaded Interceptor Software's version into the 64. Loading completed, a very impressive title section appeared with stars winking into existence and the words *Star* and *Trek* appearing from the top and bottom of the screen and scrolling towards each other. I was then given the choice (on a small and slightly off-balance menu) of instructions or various modes of play. I chose instructions and received about a dozen pages of complex and interesting instructions, none of which I could remember once the page had gone (but not to worry as I was told I could call back the instructions at any time).

I tried very hard to like this game — but I couldn't. There's no doubt that someone has worked extremely hard and long to produce an epic which does justice to the increased memory facility, but at the expense of the understanding of the player I suspect. It may have been an off-day, but I'm familiar with *Star Trek* and have played several versions on the Vic. This time I couldn't fathom how I was supposed to find the Klingons, or what was going on most of the time. It seemed as though the screen was filling with masses of information about planet types, energy supplies, warp drives, etc. Each time I pressed a Function Key I got a screenfull of information, which I was supposed to remember — I couldn't. It seems a great shame, because surely the fascinating possibilities of the game on the 64 are greatly extended, but I think the programmer knew his own game too well and has just made it too complex.

For the *Star Trek* fanatic who is really into the intricacies of War Games this is possibly a winner — for you ordinary mortals I feel this is not the one. And if you do get into a really exciting game and find time running out there's no capability to save to tape or disk — a criminal omission. It felt as though it had been rushed out for the 64 too early, and at £7.00 is too expensive.

Interceptor have also produced a 64 version of *Krazy Kong*, also priced at £7.00. The main difference in this version is that there are multi screen levels to work through. The graphics are poor, but I still found myself playing the game for rather a long time — so it must have been addictive. It's a particularly infuriating game, because besides the barrels and hammers, there are a number of randomly placed diamonds on the girders that your little man has to jump up and collect, otherwise when he gets to the girl at the top (who isn't pictured in the first screen) he won't get the prize. Unfortunately the jump key didn't always make him jump on my joystick — adding to the infuriation. But I began to get the hang of how much to jump and the distance as I got used to this version.

I think the main disappointment was the poor graphics. Kong is a poorly-outlined silhouette, the man is just a stick-like symbol, and the diamonds and hammers are very simple symbols. Although these graphics don't really spoil enjoyment of the game, with the increasing competition nowadays I suspect this will detract from the arcade copies unless there is a reduction in price.

Let's move to Anirog Software for the final review. It's the 64 version of *Frogrun*, and regular readers may remember that when I reviewed this game for the Vic I not only enthused strongly, but I can still say it's one of my favourites. Well, the 64 version is very much the same, except that a little musical tune is played when you get the frog home, and this time we have crocodiles in the river from level one (and a crocodile or two lurking in some of the homes as well to make it harder). But, for some inexplicable reason, I didn't like the graphics as much on the 64 version as I did on the Vic.

All the good points of the Vic version are present: the incredibly responsive joystick control, the fast-moving traffic, the lady frogs, the snakes on the river bank.

When compared with some versions of *Frogger* I've seen, I'm still amazed that other versions sell at all. However, there is one point that I'd like to make at this stage — and that is the ease or difficulty of games in general. I know it's hard catering for the real enthusiast — but I do feel that games are becoming harder and harder and this is not necessarily a good thing. It is probably because the programmers are themselves real enthusiasts who not only spend almost every waking hour playing, but think many of *us* do as well.

It seems to me possible to have several skill levels which allows the casual player to win reasonably easily and then he can move up a notch, whilst the true gamester can move on to a higher level from the word go. Anyway, *Frogrun* is £6.00 from Anirog Software and if you haven't a Vic then the 64 version is a good alternative.

So there we are, the 64 is getting a good share of Software at last. What I feel is that, apart from *Shadowfax*, none of the games I reviewed this time are really using the full capabilities of the machine. Commodore's own games are being released and they do show promise, but I cannot help but feel that some of the others are being rushed onto the market to fill a gap too quickly, and without proper thought for the customers or the extra facilities. ■

Supplier	Program	Price
Anirog Computers 26 Salcombe Gardens Horley Surrey	*Frogrun*	£6.00
Llamasoft Software 49 Mount Pleasant Tadley Hants	*Attack of the Mutant Camels*	£8.50
Interceptor Software Lindon House The Green Hadley Hants	*Startrek* *Krazy Kong*	£7.00 £7.00
Postern Imaginations Unlimited PO Box 2 Andoversford Cheltenham Glos	*Snake Pit* *Shadowfax*	£7.99 £7.99

An alien intelligence

***Peter Bartley** adds a postscript to his series on gameswriting for the Vic20*

Over the past six weeks I have introduced a few ideas, explained a few details and demonstrated a few tricks to beginners in Vic computing. The area we've concentrated on is what I call the "X-zaps-Y-zaps X"-type arcade games.

As I've mentioned before, these games on the Vic are dependant on the fact that the screen memory locations in front of any moving graphic missile or spaceship can be peeked to see if they've hit anything, as well as providing fine opportunities to use graphic and sound effects. Although these are the easiest to simulate, they aren't, as the video freaks among you will know, the end of the story.

There are the Maze/Chase games. A certain Atari game springs to mind, as do variants such as *Rally X*. Commodore's *Jelly Monsters* and *Rat Race* cartridges are typical conversions to the Vic, as was the ill fated Vicmen on tape. Programming here is different. The problem is to give the meanies, be they ghosts, rats or alien beings from an unknown planet, some kind of intelligence. Here again screen peeks are paramount in determining where exactly the ghosts are in the maze. The player's screen position can also be used to give them some kind of direction rather than the aimless wanderings of a random-direction generator.

This brings us to the question of giving the computer some brains. Most people shy away from programming the Vic to play against the user as being too difficult. But when it comes down to it, whenever two humans play a game they're following a set of unconscious unwritten rules. All you need to do to convert it to the Vic is to think very carefully about all the rules.

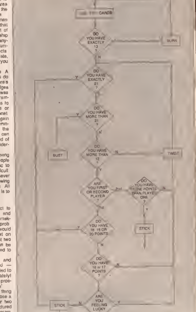
Pontoon is a prime example. Object: to get as many points above 12 and below 22 as possible. Even without making Vic the banker there's very little problem here (if it were the banker, it would then "know" when to stick or twist on every occasion). You'll find that most two player games (especially cards) can be translated into a set of rules suited to computer conversion.

After all, Othello, backgammon and even chess have been converted — though obviously you can't be expected to write a chess program immediately! However, don't be daunted by the prospect of giving your Vic "a bit o' sense".

If you haven't done this sort of thing before, the best thing to do is to choose a fairly simple card or dice game for two players and use what I call a "structured routine" as the backbone of the program. That is, have a series of *If ... Then*'s and

Continued on page 19

Figure 1



PROGRAMMING

'On Goto/Sub's gradually filtering out duff moves and finally deciding on an action

Flow-charting is very useful in this context — see Figure 1 for a sample of a pontoon routine As you can see, all the questions can be replaced by BASIC equivalents (*If SC > = 18 Then Print Stick On ' SC* etc Even the Feeling lucky? question can be simulated by the *Rnd* function

In other types of thought games it is often preferable to assign priorities to various positions or situations In the case of board/strategy games each opponent's piece (or position depending on the game) would have a different "desirability" rating according to its relative strengths and weaknesses (Just a simple numerical value so that when the computer assimilates the data it knows to go for the highest priority move or capture).

For example, in certain commercial chess programs, "taking the queen" is the highest priority move, even at the loss of one's own queen And again if we were to write our own Othello program, we would assign highest move priority to the four corners (giving them 9 say), and lowest priority to the central squares (possibly 1 or 2), since as every Othello player knows the four corners of the board are by far the most important

These are just a couple of ways of producing artificial intelligence' They're useful programming practice and hopefully more mentally stimulating than blasting aliens, and have the added interest that as your programming improves so can the Vic's playing ability

Of course there are other types of games to work on if cards/dice don't take your fancy, such as *Surround* (an old Pet game recently resurrected in the light cycle sequence of the film *Tron*) or *Battleships* (I've still to see a Vic *Battleships* that really plays and isn't just a vamped up guessing game using the random number generator) Then you can start inventing your own strategy games

The thing about games of this sort is that they're so well suited to BASIC *Poke*ing 50 Space Invaders on and off the screen, as well as scanning for hits/misses and key presses is going to take a very long time — which doesn't make for a very exciting game That doesn't mean that all arcade games are out ones with just a few characters adapt well especially 'oldies like *Dogfight* for example

Other games include adventures but with only 3.5K there's very little room to produce a game with any real variation The technique is to first define your playing area — caverns, planets etc and more importantly how they are connected Scatter a few monsters about and a few things to collect and let someone else loose on it (after all you'll know its ins and outs already!)

Going back to the point about memory try and keep all your programs as streamlined as possible Apart from obvious techniques such as keeping excess characters to a minimum, there's the not-so-obvious like sound effects subroutines whose parameters are defined before *Gosubbing* Even just a simple delay loop as a subroutine saves a tremendous amount of memory in longer programs

A final word about gameswriting To be frank Vic games in magazines have dropped dramatically in number recently They haven't got any worse in fact the quality has markedly improved but the problem seems to be a lack of topics If you're stuck for something to write about just look around you! Look at a few books for inspiration (but mind the copyright!) — there's everything from the entire animal, vegetable and mineral kingdoms to sports and simulations, machinery and monarchies, racing and reflexes the list is endless Use your brains (if too much Vic computing hasn't caused them to atrophy) after all who thought up all those arcade games in the first place? ■

Interrupted lesson

***Guy Dobinson** explains how to teach French in the classroom – by interrupting*

The following interrupt routines were developed to be used in programs intended for the teaching of French in classrooms The main programs had to be written in Basic for reasons of easy adaptation but two serious problems could not be solved using this language

Firstly letters with accents had to be entered as user defined graphics without constant fiddling with the graphics key Secondly the *Break* key had to be dis abled True the *Break* key can be disabled by *Poking* the lower part of the screen down to zero lines but then any attempt to *Break* causes a crash and the program has to be reloaded from scratch

In both cases interrupt routines provided the answer Furthermore, interrupt routines are an ideal place for the inexperienced machine code programmer to start as once the basic principle of an interrupt has been grasped even a very short program can produce very impressive results I hope to demonstrate this, and show how the reader can use the same techniques to his own advantage

In normal operation the Spectrum Rom uses 'Interrupt Mode 1 to scan the keyboard every 20ms We want to divert these interrupts to our own routines, so need short machine programs to switch between the two modes By simply loading the I for interrupt register with 9 (40 for 16K machines) and turning to "Interrupt Mode 2' the interrupts are diverted to location 65129 (16K 32348) where we place our routine

In order to return control to the Rom program all interrupt routines must follow a similar pattern (i) We must call the keyboard scanning routine as we have diverted the normal interrupts away from this — *RST 56* (ii) The interrupts must then be disabled for the duration of our routine to prevent it being called while it is already in operation — *DI* (iii) The registers used by our routine must be *Pushed* (saved) then *Popped* (restored) after use to prevent a crash (iv) The interrupts must be re-enabled — *EI* — ready for next time before finally *Returning* to the Basic system See Figure 3

Now to solve our first problem The idea is to use an interrupt routine to constantly check the value representing the last key pressed and stored by the Rom program in the system variable *Lastk* (location 23560) We store this value in register *A* and compare it with 48 the character code for "0" If the actual value is less all is well and we return to Basic If it is greater than 48, it is then checked against an upper limit of 58 (' 9 +1)

If the value passes the second test control is returned to the Rom But should it fail both tests then 96 is added to the value in register *A* to give the code for the appropriate udg This is then copied into *Lastk* before returning In short whenever the user types in a character between 0 and '9 this is snatched away and replaced before the Rom even has a chance to print it in an Input line

The Basic program in Figure 1 demonstrates this routine after setting up as udgs the different letter/accent combinations used in French With this routine you can write or adapt any word game to work in French, or any other accented language

To solve the second problem we need to use *Lastk* again and two more systems variables *Ermr*, which holds the number of the current report code minus one and *Flags* bit 5 of which indicates to the Rom program that a new key has been pressed We will also use our own variable *Key* See Figure 4

The principle is this — *Ermr* is checked to see if it holds 255 for −1 Report '0 OK If not load 232 for '*Continue* into *Lastk* *Set* bit 5 of *Flags* to fool the Rom into thinking this is a new key press then *Set* bit 0 of our own *Key* to show that this has been done On the next interrupt the routine checks *Ermr* then *Key* loads 13 for "*Enter*' into *Lastk* and again *Sets* bit 5 of *Flags* finally resetting bit 0 of *Key* ready for the next time that the *Break* key is used In effect every time an error occurs the system thinks that the user has promptly pressed *Continue* and then *Enter*

This is demonstrated by the Basic Program in Figure 2 Run it and once numbers appear in the top left hand corner of the screen, try holding down *Capshift* and *Break* — you will see the *Break* report code and the *Continue* command superim-

Figure 1

```
  10 CLEAR 65109  REM 16K= 32327
  20 GO SUB 9000
  30 RANDOMIZE USR 65110  REM
16K = 32330
  40 FOR n=0 TO 1000  PRINT AT 0
,0,n  NEXT n
  50 RANDOMIZE USR 65120  REM
16K = 32340
  60 STOP
9000 LET code=65110  REM for 16K
 read 32330
9010 LET b=0  FOR n=code TO code
+78  READ a  POKE n,a  LET b=b+a
 NEXT n
9020 IF b<>23,3 THEN PRINT "Erro
r in code data"  STOP  REM for
16K read 9874
9030 DATA 62,9  REM for 16K read
 DATA 62,40
9040 DATA 237,71,237,94,201,0,0,
0,62,62,237,86,237,71,201,0,0,25
5,245
9050 DATA 245,229,221,229,33,59,
92,221,33,162,254,58,59,92,254,
55 40,31,58,162,254 254,1
9060 DATA 40,13,62,232,50,8,92,
62,238,221,203,0,198,24,11,62,1
50,0,92,201,238
9070 DATA 221,203,0,134,221,225
225,241,201,201,0
9080 RETURN
```

Figure 2

```
   5 CLEAR 65109  REM for 16K re
ad 32329
   7 GO SUB 9000
  10 RANDOMIZE USR 65110  REM
for 16K read 32330
  20 INPUT n$
  30 PRINT n$
  40 RANDOMIZE USR 65120  REM
16K = 32340
  50 STOP
8000 LET code=65110  REM  16K =
32330
8010 LET b=0  FOR n=code TO code
+40  READ a  POKE n,a  LET b=b+a
 NEXT n
8020 IF b<>4637 THEN PRINT "Erro
r in code data"  STOP  REM 16K
= 4668
8030 DATA 62,9  REM  16K = DATA
62 40
8040 DATA 237,71,237,94,201,0,0,
0,62,62,237,86,237,71,201,0,0,25
5,245
8050 DATA 245,58,8,92,254,48,56,
9 254,58,48,5,198,96 50,8,92,241
,251,201
9000 LET b=0  FOR n=USR "a" TO U
SR "u"+7  READ a  POKE n a  LET
b=b+a  NEXT n
9005 IF b<>3304 THEN PRINT "Erro
r in UDG data"  STOP
9010 DATA 48,8,0,60,60,66,56,0
9020 DATA 24,36,0,60,60,66,62,0
9030 DATA 24,4,0,60,66,66,62,0
9040 DATA 0,0,60,64,64,60,8,24
9050 DATA 48,64,56,68,120,64,60,
0
9060 DATA 48,72,56,68,120,64,60,
0
9070 DATA 24,4,56,68,120,64,60,0
9080 DATA 16,40,0,16,16,16,16,0
9090 DATA 16,40,0,56,68,68,56,0
9100 DATA 16,40,0,66,66,66,56,0
9110 RETURN
```

posed in the lower part of the screen. Unfortunately, it does not work when *Stop* is entered in response to an input — the report is given, then a number of interrupts occur before the system is ready for a new command.

As it is a little more complex than the scope of this article, I'll leave the actual coding to you — but the simplest solution is to use another variable like *Key* to enter *Continue* three times. Alternatively, there are many other short machine code routines which can easily be converted for use with interrupts. Don't be afraid to experiment! ■

Figure 3

```
10 LASTK  EQU  23560
20
30 ; On routine
40        ORG  65110
50        LD   A,9
60        LD   I,A
70        IM   2
80        RET
100 ; Off routine
110       ORG  65120
120       LD   A,62
130       IM   1
140       LD   I,A
150       RET
160
170 ; Substitute routine
180       ORG  65129
190       RST  56
200       DI
210       PUSH AF
220       LD   A,(LASTK)
230       CP   48
240       JR   C,Exit
250       CP   58
260       JR   NC,Exit
270       ADD  A,96
280       LD   (LASTK),A
290 Exit  POP  AF
300       EI
310       RET
```

Figure 4

```
130         ORG  65129
140 ERRNR   EQU  23610
150 LASTK   EQU  23560
160 FLAGS   EQU  23611
180         RST  56
190         DI
200         PUSH AF
210         PUSH HL
220         PUSH IX
230         LD   HL,FLAGS
240         LD   IX,KEY
250         LD   A,(ERRNR)
260         CP   255
270         JR   Z,OUT
280         LD   A,(KEY)
290         CP   1
300         JR   Z,ENTER
310         LD   A,232;CONTINUE
320         LD   (LASTK),A
330         SET  5,(HL)
340         SET  0,(IX)
350         JR   OUT
360 ENTER   LD   A,13 ;ENTER
370         LD   (LASTK),A
380         SET  5,(HL)
390         RES  0,(IX)
400 OUT     POP  IX
410         POP  HL
420         POP  AF
430         EI
440         RET
450 KEY     DEFS 0
```

Town planning

***Ian Robertson** presents a high-resolution geography program*

I was most impressed with John Meech's geography program for the BBC B which appeared in *PCW* 1-7 September 1983 I am however one of those (probably few) schoolteachers who are not enamoured of the BBC machine, and I thought that it should be possible to produce something on similar lines (and more colorful — deliberate spelling) on my old faithful Dragon

I am indebted to Mr Meech for his method of plotting the map using the BBC's *Move* and *Draw* statements, but readers might be interested to realise that these can be reproduced exactly in the Dragon's high resolution modes by using *Draw BM x,y* and *Line −(x y)* The screen parameters are of course 255 and 191 as opposed to the Beeb's 1279 and 1023

A complete character set *(Ch$(0)* to *Ch$(35))* which represents the digits 0 to 9 and the letters *A* to *Z* is included in the program The digits and letters are in the form of strings which can be used with the Dragon's *Draw* statement either directly in the form *Draw Ch$(x) + Ch$(y)* etc in any scale and in any colour or by extracting characters from normal strings using the *Asc* function to obtain the *Ch$* number (you have to deduct 48 to get the digits and 55 to get the letters)

The actual shape of the drawn letters etc I have had in stock for some time I think they came originally from an American magazine and if you don't like their shape they can always be redrawn to suit individual tastes

Originally, I intended to produce this program using *Pmode4* with black characters and map on a white background, and using the drawn characters in normal scale Experiments showed, however that a more impressive display could be obtained using colours and *Pmode3* In this case, the characters had to be scaled up to retain their correct shape

I also contemplated including more than one map and set of towns and a menu choice There would appear to be plenty of memory left in the Dragon to do this Readers might care to play about with these ideas — what about running it in *Pmode1* and *Pcopying* to other pages? In this way it should be possible to hold four maps in memory and access them by calling different pages in *Pmode1*

The actual map and town coordinates were produced using a 15 × 19 grid on squared paper The line numbers of the grid were (in steps of 10) 105 to 255 horizontally and 0 to 190 vertically, making it quite easy to estimate the intermediate points These numbers were chosen to match the right-hand side of the Dragon's screen

A rather strange thing happened when trying to erase the town numbers and the *Ok* or *No* in the lower left-hand box (Line 2100) I wanted to *Paint* in red on red to a limit of yellow (thus erasing the green letters which were on the red background) but found it would not work I got over the problem by *Painting* in green first and then in red, but I am still mystified Perhaps someone knows the answer

Notes

Lines	
10	Goes to the subroutine to put the character set into array CH$
20-190	Draws the title page using the character set in various scales and colours
1000-1230	Sets up the display and draws the map The words BRITISH TOWNS are drawn by extracting in turn from the strings A$ and B$ (by means of the ASC function) the codes of the correct "DRAW" string held in the array CH$
2000-2120 (Main Loop)	Puts the town names and coordinates into arrays TT$ X$ and Y$ Lines 2050-2060 draws each town number in the correct place and alternately PRESETs and PSETs a dot at the town's location Lines 2070 asks for the name of the town to be spelt. Lines 2080-2120 compare the spelling and flash either OK or No on the screen and computes the score
3000-3050	Ending routine
4000-4360	Subroutine and data for character set.
5000-5050	Data for map
6000-6090	Data for towns and town coordinates
7000-7100	Subroutine for instructions

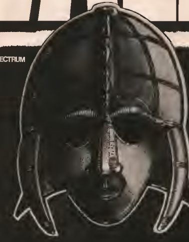
```
1 REM******************************
2 REM*        TOWNS               *
3 REM*    BY IAN ROBERTSON        *
4 REM*     SEPTEMBER 1983         *
5 REM******************************
7 REM
9 REM *****GET CHARACTERS INTO
     ARRAY AND DRAW TITLE
     SEQUENCE *****************
10 GOSUB4000
20 A$="BRITISH":B$="TOWNS"
30 PMODE1,1:SCREEN1,1:PCLS
50 DRAW BM40,60S16C7
51 FORN=1TOLEN(A$):DRAW CH$(ASC(
LEFT$(A$,1))-55)
60 A$=RIGHT$(A$,LEN(A$)-1)
70 NEXT
80 DRAW BM60,110"
90 FORN=1TOLEN(B$):DRAW CH$(ASC(
LEFT$(B$,1))-55)
100 B$=RIGHT$(B$,LEN(B$)-1)
110 NEXT
120 DRAW BM12,170S8C8"+CH$(11)+C
H$(34)
130 DRAW BM+10,+0"+CH$(18)+CH$(
+CH$(2
140 DRAW BM+10,+0"+CH$(27)+CH$(2
4)+CH$(11)+CH$(14)
150 DRAW CH$(27)+CH$(29)+CH$(29)+
CH$(24)+CH$(23)
160 FORN=1TO600:NEXT:SOUND
170 DIMTT$(10),X(10),Y(10):S=0
180 CLS:PRINT@196,"DO YOU WANT
INSTRUCTIONS?":PRINT@297,"TYPE
(Y OR N)":SCREEN0,1
190 K$=INKEY$:IFK$=""THEN190 ELS
E IF K$="Y"THENGOSUB7000
999 REM******SET UP DISPLAY AND
     MAP *********************
1000 PMODE3,1:COLOR ,1:SCREEN1,
1:PCLS
1010 LINE(105,0)-(255,191),PSET,B
1020 LINE(
1030 LINE(
1040 PAINT(
1,
1050 FORI=1TO
1060 READX,Y
1070 IFX=-1 AND Y=-1 THENREADX,Y
:DRAW BM"+STR$(X)+","+STR$(Y)
1080 LINE-(X,Y),PSET
1090 NEXTI
1100 A$="BRITISH"
1110 DRAW BM4,2 S8
1120 FORN=1TOLEN(A$)
1130 DRAWCH$(ASC(LEFT$(A$,1))-55
)
1140 A$=RIGHT$(A$,LEN(A$)-1)
1150 NEXTN
1160 DRAW BM16,40"
1170 B$="TOWNS"
1180 FORN=1TOLEN(B$)
1190 DRAWCH$(ASC(LEFT$(B$,1))-55
)
1200 B$=RIGHT$(B$,LEN(B$)-1)
1210 NEXTN
1220 PAINT(107,2),3,2
1230 PAINT(195,120),1,7
1999 REM*******PUT TOWN NAMES
      AND COORDINATES INTO
      ARRAYS AND DRAW FLASHING
      TOWNS*******************
2000 FORN=1TO10
     READTT$(N),X(N),Y(N)
2020 NEXT
     FOR TU=1 TO10
2040 DRAW BM
H$(24)+CH$(
2045 IFT
H$(
2050 DRAW
```

```
   REM *******ASK FOR ANSWER
          AND DRAW FLASHING OK
          OR NO ****************
   CLS:PRINT@384,"SPELL THE N
AME AND PRESS ENTER ";:PRINT@2
4  :INPUT"WHAT TOWN WAS THAT";
T$
   PRINT@ TURN-1)01:DRAW S
        $(C)
   IFT$=T1$(TU) THENDRAWCH$(24
      FORD=1TO500:NEXT:DRAW"
   H$(24)+CH$(20):FORD
 =1TO  :NEXT ELSE DRAWCH$(
      FORD=1TO500:NEXT:DRA
W  CH$(23)+CH$(24):FO
   NEXT:NEXT
   FORD=1TO   NEXT:PAINT(
   PAINT(  ,189),4,2
   IFT$=T1$(TU) THEN S=S+1
   NEXT TU
   REM*******ROUTINE FOR SCORE
          AND ENDING**************
3000 CLS7:PRINT@69,"YOU SCORED ";
S;" OUT OF 10";:PRINT@175,"DO YOU
 WANT TO TRY AGAIN?";
3010 PRINT@296,"PRESS Y OR N
";:SCREEN0,1
3020 R$=INKEY$:IFR$="" THEN3020 E
LSE IF R$="Y"THENRUN
3030 CLS6:PRINT@196,"THANK YOU F
OR PLAYING";:SCREEN0,1
3040 FORN=1TO3000:NEXT:CLS
3050 END
3999 REM ******* SUBROUTINE FOR
          ARRAY AND DATA FOR
          CHARACTER SET**********
4000 DIMCH$(35)
4010 FORX=0TO35:READCH$(X):NEXT
4020 DATA "BU1U4E1R2F1D4G1L2H1BD
1M+4,-6BD6BR3
4030 DATA "BU5BR1E1D6NL1R1BM+4,+
0"
4040 DATA "NR4U1BU3U1E1R2F1D1G1L
1G2BM+7,+1
4050 DATA "BU5E1R2F1D1G1NL2F1D1G
1L2NH1BM+7,+0
4060 DATA "BU3NR4M+3,-3D6BR+4,+0
"
4070 DATA "BU4NR3U2R4BD2BL1F1D2G
1L2H1BM+7,+1"
4080 DATA "BU6BR3NF1L2G1D2NR3D2F
1R2E1U1H1BM+4,+3
4090 DATA "U1D0U5R4D1M-4,+4BM+7,+
1"
4100 DATA "BU1U1E1R2E1U1H1L2G1D1
F1R2F1D1G1L2H1BM+7,+1
4110 DATA "BU1F1R2E1U4H1L2G1D1F1
R3BM+7,+3
4120 DATA "U6E1R2F1D3NL4D2BR
4130 DATA "U6R3F1D1G1NL3F1D1G1L3
BR7
4140 DATA "BU1U4E1R2F1BD4G1L2H1B
R7BD1
4150 DATA "R1U6NL1R2F1D4G1L2BR6
4160 DATA "U3NR3U3R4BD6L4BR7
4170 DATA "U3NR3U3R4BD6BR7"
4180 DATA "BU1U4E1R3BD4NL1D2L3H1
BR7BD1
4190 DATA "U3NR4U3BR4D6BR
4200 DATA "BU6BR1F1ND6R1BR1BD6BL
3L1BR6
4210 DATA "BU2D1F1R2E1U5BD6BR"
4220 DATA "U6BR4M-4,+3M+4,+3BR"
4230 DATA "NU6R4BR3
4240 DATA "U6M+2,+3M+2,-3D6BR3"
4250 DATA "U6M+4,+6U6BD6BR3
4260 DATA "U6R4D6L4BR7"
4270 DATA "U6R3F1D1G1L3D3BR7
4280 DATA "BU1U4E1R2F1D4G1L2H1BE
1M+1F ER
4290 DATA "U6R F1D1G1L3R1M+3,+3"B
R
4300 DATA "BU1F1R2E1U1D0 H1L2G1D
1M+  + BR BD2
4310 DATA "BU6R3ND6R2BD6BR
4320 DATA "BU1U5BR4D5G1L2H1BD1BR
4330 DATA "BU6M   +AM+2  ABD6BR"

4340 DATA "U6BR4D6M  -2NU1M 2,+
2BR7
4350 DATA "U1M+4,-4U1BL4D1M+4,+4
D1BR3
4360 DATA "BR2U3M- ,-2U1BR4D1M
+2BD3BR5
4370 DATA "BU6R4M-4,+6R4BR3
4380 RETURN
4999 REM ******* DATA FOR MAP***
5000 DATA -1,-1,160,175,170,180
175,170,180,175,195,175,205,165
205,160,215,162,225,167,230,167,
245,157,242,150,225,150,240,140,
24 ,170
5010 DATA238,122,225,121,225,124
220,130,218,120,215,118,207,112
,197,95,200,85,192,78
5020 DATA 185,85,182,75,185,70,2
10,45,185,42,197,19,185,21,175,2
0,170,20,165,70,162,47,153,53,15
5,60
5030 DATA 165,55,155,70,160,74,1
70,60,171,62,170,70,172,75,162,6
7,165,94,175,91,170,105,175,105,
175,120,155,115,160,123
5040 DATA 155,131,166,131,166,13
9 155,145,160,151,172,145,175,14
8,185,141,193,143,185,150,175,15
1,168,160,163,160
5050 DATA 167,165,145,170,150,18
0,160,175
5999 REM ******* DATA FOR TOWNS
          AND TOWN COORDINATES***
6000 DATA LONDON,223,150
6010 DATA LIVERPOOL,177,120
6020 DATA MANCHESTER,185,117
6030 DATA BIRMINGHAM,205,135
6040 DATA NEWCASTLE,194,95
6050 DATA GLASGOW,175,75
6060 DATA CARDIFF,180,142
6070 DATA PLYMOUTH,165,176
6080 DATA YARMOUTH 239 170
6090 DATA LEEDS,175,110
6999 REM*******INSTRUCTIONS*****
7000 CLS7:PRINT@33,"YOU WILL SEE
 A MAP OF BRITAIN.";:PRINT@65,"Y
ELLOW DOTS WILL FLASH ON AND ";:
PRINT@97,"OFF AT VARIOUS PLACES
ON THIS ";
7010 PRINT@129,"MAP AND YOU WILL
 BE ASKED FOR ";:PRINT@161,"THE
NAME OF THE TOWN.        ";:PRI
NT@193,STRING$(30,32);
7020 PRINT@225,"YOU MUST ENTER T
HE NAME OF THE ";:PRINT@257,"TOWN
 (SPELT CORRECTLY) AND    ";:PRI
NT@289,"PRESS ENTER  YOU WILL
THEN    ";:PRINT@321,"BE TOLD IF Y
OU ARE RIGHT  YOUR";:PRINT@353,"
SCORE WILL BE GIVEN AT THE END ";
7030 PRINT@385,STRING$(30,32);:P
RINT@417,"DO YOU WANT A LIST OF
THE      ";:PRINT@449,"TOWNS? TYP
E Y  OR  NO         ";
7040 SCREEN0,1
7050 R$=INKEY$:IFR$="" THEN7050 E
LSE IF R$="N" THENRETURN
7060 CLS PRINT@0,STRING$(32,147+
16);:FORN=1TO14:PRINT@32*N,CHR$(1
59);:PRINT@3 +N*31,CHR$(159);:NE
XT:PRINT@480,STRING$(31,159);:PO
KE1535,159
7070 PRINT@65,"THE TOWNS ARE (BU
T NOT IN THIS";:PRINT@97,"ORDER)
:-";:PRINT@164,"LEEDS       MANC
HESTER ";:PRINT@196,"YARMOUTH
NEWCASTLE".
7080 PRINT@228,"BIRMINGHAM  PLYM
OUTH";:PRINT@260,"LIVERPOOL    CA
RDIFF";:PRINT@292,"GLASGOW      L
ONDON";:PRINT@418,"PRESS spaceba
r TO CONTINUE";
7090 R$=INKEY$:IFR$<>CHR$(32)THE
N7090
7100 RETURN
```

VALH

48K SPECTRUM





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PCWK 38

Erased

Hi-res graphics for the 64

Module 3.4.2

This module allows a flashing pixel to be moved around the screen, inking in and erasing individual pixels.

Commentary

Line 11030: X and Y are the co-ordinates of the pixel on the 300•200 screen. The flashing pixel cursor is set to the middle of the screen. The first position in normal screen memory is POKEd with a value which produces a colour indicator of the current mode (black = 0, red = 1, purple = 2, blue = 3). Effects of modes will be explained later.

Line 11040: The state of the screen at the position at which the cursor is to be flashed is obtained.

Lines 11042-11050: The cursor is flashed on and off until a key is pressed.

Lines 11060-11072: In mode 3, pressing the cursor arrow results in the flashing pixel moving 10 positions in the required direction (within screen limits). In modes 0, 1 and 2 the cursor moves only one space at a time.

Line 11075: The unshifted function keys, from top to bottom, are used to set the modes. If the mode is changed the colour indicator is changed.

Lines 11080-11090: If the mode is zero (black) then the pixel at the cursor position is blanked. If the mode is 1 (red) then the pixel is inked in. The remaining two modes allow the cursor to be moved around, slow or fast, without affecting what is on the screen.

Lines 11100-11120: These inputs relate to the next module.

Testing Module 3.4.2

You should now be able to move the tiny cursor around the screen, drawing or erasing.

Module 3.4.3

This module provides for the drawing of straight lines between points defined by the user. It is an adaptation of a method known as Bresenham's algorithm and a version of it is often used in those Basics which have line drawing commands.

Commentary

Line 12025: The values X1 and Y1 were defined when the user input 1 — at that point they were set equal to the X and Y positions of the cursor. X2 and Y2 were set on input of 2. The line will be drawn from X1,Y1.

Line 12030: DX and DY are set equal to the distance between X1 and X2, and Y1 and Y2, plus one. The SGN function means that it does not make any difference if the distance is positive or negative (if it is negative then minus one will be added rather than 1).

Line 12032: The line-drawing algorithm uses the greater of the two differences as the basis of its calculations so it is faster to have two separate routines.

Line 12035: SL is the slope, or ratio between DX and DY minus 0.5.

Lines 12040: The loop is as long as the difference along the X co-ordinate.

Lines 12050-12055: Depending on whether the mode is 0 or 1, a single dot on the line is erased or drawn. Note that nothing will happen in modes 2 or 3.

Line 12060: According to the ratio between DX and DY, SL may now indicate that the next dot should move up or down the Y axis. If so the Y position is changed and SL is reduced by one.

Line 12070: The slope value is added to SL each time a dot has been printed.

Line 12100: The X position is incremented for each iteration of the loop. Once again the SGN function takes care of lines which move backwards along the axis.

Lines 12200-12250: Exactly the same routine for those cases where DY is greater than DX.

Testing Module 3.4.3

You should now be able to specify a start and end point for a line (1 and 2) then to draw it or erase an existing line, depending upon whether mode 1 or 0 is set.

Summary

This program is intended as no more than an appetiser for the possibilities raised by the bit-mapped mode. Full use of bit-mapped graphics requires some careful thought as to what you wish to achieve and some often complex mathematics to achieve it. Should you decide to go further, the techniques given here, and the functions used to locate individual pixels, will make the task that much easier.

Going further

(1) Why not add a facility allowing the saving of a screen of graphics onto tape — you'll need a fairly long tape but the routine would be simple enough.

(2) Computer graphics books provide a number of algorithms which allow the drawing of circles and arcs. Why not add a module to the end of the program to achieve this — the main drawback will be lack of speed. ■

This is an extract from *The Working Commodore 64* by David Lawrence, published by Sunshine Books.

MODULE 3.4.2

```
11000 REM******************************
11010 REM DRAW ON SCREEN
11020 REM******************************
11030 X=160 Y=96 MO=1 POKE 1024,(PEEK(10
24)AND240) OR (MO*2)
11040 TT=PEEK(FNPP(X))
11042 GET A$ IF A$<>"" THEN 11050
11044 POKE FNPP(X) FNPV(X) POKE FNPP(X)
FNPE(X) GOTO 11042
11050 POKE FNPP(X),TT
11060 IF MO<3 THEN X=X-(A$="■" AND X<319
)+(A$="■" AND X>0)
11062 IF MO=3 THEN X=X-10*(A$="■" AND X<
310)+10*(A$="■" AND X>10)
11070 IF MO<3 THEN Y=Y-(A$="■" AND Y<191
)+(A$="■" AND Y>0)
11072 IF MO=3 THEN Y=Y-10*(A$="■" AND Y<
182)+10*(A$="■" AND Y>10)
11075 IFA$="*"THEN MO=MO+1 MO=MO+4*(MO>3
) POKE1024,(PEEK(1024)AND240)OR(MO*2)
11080 IF MO=1 THEN POKE FNPP(X),FNPV(X)
11090 IF MO=0 THEN POKE FNPP(X),FNPE(X)
11100 IF A$="1" THEN X1=X Y1=Y
11110 IF A$="2" THEN X2=X Y2=Y
11120 IF A$="L" THEN GOSUB 12000
11200 GOTO 11040
11499 GOTO 11499
```

MODULE 3.4.3

```
12000 REM******************************
12010 REM LINE DRAWING
12020 REM******************************
12025 X=X1 Y=Y1
12030 DX=X2-X1+SGN(X2-X1) DY=Y2-Y1+SGN(Y
2-Y1)
12032 IF ABS(DY)>ABS(DX) THEN 12200
12035 SL=ABS(DY/DX)-0.5
12040 FOR I=1 TO ABS(DX)
12050 IF MODE=1 THEN POKE FNPP(X),FNPV(X
)
12055 IF MODE=0 THEN POKE FNPP(X),FNPE(X
)
12060 IF SL>0 THEN Y=Y+SGN(DY) SL=SL-1 G
OTO 12060
12070 SL=SL+ABS(DY/DX)
12100 X=X+SGN(DX) NEXT I
12120 RETURN
12200 SL=ABS(DX/DY)-0.5
12210 FOR I=1 TO ABS(DY)
12220 IF MODE=1 THEN POKE FNPP(X),FNPV(X)
12225 IF MODE=0 THEN POKE FNPP(X),FNPE(X)
12230 IF SL>0 THEN X=X+SGN(DX) SL=SL-1 G
OTO 12230
12240 SL=SL+ABS(DX/DY)
12250 Y=Y+SGN(DY) NEXT I
12300 RETURN
```


Virgin Games.
GSH
THE AMAZING ADVENTURES OF THE
LAUGHING SHARK
PART ONE
WHAT A CREEPY KEEP
OH I DO LIKE TO
THE LAUGHING SHARK TORPEDOED TO THE SURFACE ONLY TO FIND HE WASN'T IN THE SUNNY PACIFIC – BUT IN THE DARK MURKY MOAT OF THE.......
BESIDE THE SEASIDE
MOAT HOG!!
THIS CRUISE COULD GO WITH A BANG!
CASTLE ADVENTURE WITH A THOUSAND DASTARDLY DEATHS – ACCOMPANIED BY THE MAD ORGANIST-PULLING OUT ALL THE STOPS ... ...
ESCAPING THE DEADLY SOUND OF MUSIC, THE LAUGHING SHARK NARROWLY AVOIDED A CRUISE LINER – IN A MOAT?!!
PASSING A PORTHOLE HE ESPIED HASTY DR SINISTER PLANTING A BOMB. STOP HIM SOMEONE – OR THIS COULD TURN INTO A... DEATH CRUISE!!
HO-RI HEXAGLAMS! A FRYING SHARK
WHAT ABOUT MY FUTURE?
A PART IN JAWS IV MAYBE?
MORE FRUSTRATING ZAN ZE RUBIC CUBE
NOT WISHING TO SUFFER THE SAME FATE AS HIS COUSIN JAWS, OUR HERO DECIDED TO CONSULT THE ORACLE OF I CHING....
THE 4,000 YEAR OLD CHINESE ART OF THE HEXAGRAM – WITH ITS KEY TO FUTURE AND THE
OVERFLOWING WITH NEWLY FOUND SELF-CONFIDENCE, LAUGHING BOY FELT READY TO HELP PROF BATTY SOLVE THE PROBLEM OF LOJIX AND FIT THE SHAPES —
50p X
THIS IS THE PITS!!
HOP ON A VIRGIN BUS
–INTO THE ... IF YOU MANAGE TO SOLVE IT, YOU COULD WIN THE ... POT OF ...
DIZZY FROM HAVING TO USE HIS LITTLE FISHY BRAIN OUR INTREPID 'CHUCKLES' GOT LOST AND FOUND HIMSELF IN THE DANK DEPTHS OF KILLER CAVERNS..
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Rotating ellipses

***Michael Batty** explains how to rotate ellipses in the second of a three-part series*

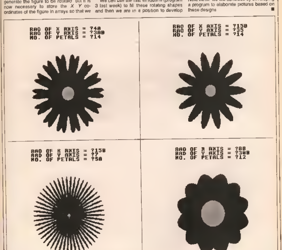
Last week we presented programs to draw and fill ellipse shapes which had fixed orientations on the screen In extending our computer art we need to be able to rotate these shapes To do this we will use standard two-dimensional transformations which change the orientation but keep the scale and origin of the figure fixed We will generate patterns by regular rotation of ellipses around a fixed origin forming designs which resemble the petals of a flower, the cogs of a wheel or the points of a star

The program to draw an ellipse (given last week as program 2) can be used to generate the figure to be rotated but it is now necessary to store the *X Y* co-ordinates of the figure in arrays so that we can continually transform these points to other positions The transformations used are quite standard involving simple sine and cosine functions They are given in most introductions to computer graphics — Roy Myers *Microcomputer Graphics* (Addison-Wesley 1982) is a good reference

Program 1 shows how this rotation can be done In fact if you look at the way we originally generated the co-ordinates of the ellipse (lines 120 130) and the way we transform these (lines 230, 240) you will see the same transformations are involved When you run program 1 initially use *XX* and *YY* values between 10 and 200 measure *TH* the angle of rotation or pivot in degrees and finish the rotation with *TH = 0*

We can use the fast fill routine (program 3 last week) to fill these rotating shapes and then we are in a position to develop some nice formal designs Program 2 enables you to set up different sizes of ellipse with *XX* and *YY* radii and to rotate them regularly from a fixed origin by specifying the number of ellipses — we call them petals — forming the rotation We then fill the centre of the resulting flower-like picture with a circle The program is structured as a set of Procedures we set up the original ellipse using *Procsetup*, rotate it using *Proctransf* and plot a centre circle using *Procsetup* once again Each time we fill the ellipse using *Procfill*

This program can be used to explore a variety of shapes in the time-honoured experimental fashion of computer art Typical designs are also illustrated Once you have got a feel for the program, go wild and put in negative sizes, and sizes much larger than the screen limits, and you will generate some dramatic effects Next week we will conclude by developing a program to elaborate pictures based on these designs ■



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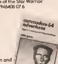
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PROGRAM 1

```
10 REM Fixed Rotation of Ellipses
20 MODE1:VDU28,0,1,39,0
30 DIM X(60),Y(60)
40 REPEAT
50   INPUT"RADIUS OF X AXIS = ",XX
60   INPUT"RADIUS OF Y AXIS = ",YY
70   VDU29,640;512;
80   DT=2*PI/60:A=XX/YY
90   C=COS(DT):S=SIN(DT):SX=S/A:SY=S*A
100  XA=XX:YA=0:MOVE XA+XX,YA
110  FOR I%=1 TO 60
120    T=XA*C-YA*SY
130    YA=YA*C+XA*SX:XA=T
140    X(I%)=XA+XX:Y(I%)=YA:DRAW XA+XX,YA
150    NEXT I%
160  REPEAT
170    INPUT"ANGLE OF PIVOT = ",TH
180    TH=RAD(TH):CC=COS(TH):SS=SIN(TH)
190    XA=X(60)*CC-Y(60)*SS
200    YA=X(60)*SS+Y(60)*CC
210    MOVE XA,YA
220    FOR I%=1 TO 60
230      XA=X(I%)*CC-Y(I%)*SS
240      YA=X(I%)*SS+Y(I%)*CC
250      DRAW XA,YA
260      NEXT I%
270    UNTIL TH=0
280  AA=GET:CLS
290  UNTIL FALSE
300 END
```

PROGRAM 2

```
10 REM Exploring Patterns of Ellipses
20 REM (C)Michael Batty,1983
30 MODE1
40 DIM X(60),Y(60)
50 VDU23,1,0;0;0;0;
60 REPEAT
70   INPUT TAB(10),"RAD OF X AXIS = ",XX
80   INPUT TAB(10),"RAD OF Y AXIS = ",YY
90   INPUT TAB(10),"NO. OF PETALS = ",N
100  VDU29,640;512;
110  GCOL0,1
120  PROCSETUP(XX,YY)
130  TH=2*PI/N
140  FOR K%=1 TO N-1
150    PROCTRANSF(TH)
160    NEXT K%
170  IF XX>=YY THEN Z=YY ELSE Z=XX
180  Z=Z*1.25:XX=Z:YY=Z
190  VDU29,640-XX;512;
200  GCOL0,2
210  PROCSETUP(XX,YY)
220  AA=GET:CLS
230  UNTIL FALSE
240 END
250 DEFPROCSETUP(XX,YY)
260 DT=2*PI/60:A=XX/YY
270 C=COS(DT):S=SIN(DT):SX=S/A:SY=S*A
280 XA=XX:YA=0
290 FOR I%=1 TO 60
300   T=XA*C-YA*SY
310   YA=YA*C+XA*SX:XA=T
320   X(I%)=XA+XX:Y(I%)=YA
330   NEXT I%
340 PROCFILL
350 ENDPROC
360 DEFPROCTRANSF(TH)
370 C=COS(TH):S=SIN(TH)
380 FOR I%=1 TO 60
390   T=X(I%)*C-Y(I%)*S
400   Y(I%)=X(I%)*S+Y(I%)*C:X(I%)=T
410   NEXT I%
420 PROCFILL
430 ENDPROC
440 DEFPROCFILL
450 MOVE X(60),Y(60):MOVE X(1),Y(1)
460 PLOT85,X(59),Y(59)
470 FOR I%=2 TO 29
480   PLOT85,X(I%),Y(I%):J%=60-I%
490   PLOT85,X(J%),Y(J%)
500   NEXT I%
510 PLOT85,X(30),Y(30)
520 ENDPROC
```

Open Forum is for you to publish your programs and ideas. Take care that the listings you send in are all bug-free. Your documentation should start with a general description of the program and what it does and then give some detail of how the program is constructed. We will pay the *Program of the Week* double our new fee of £6 for each program published.

Death Race

on Vic20

This program is intended for people like me ie. those people who have a warped sense of humour. The idea of the game is to run over as many people as possible whilst avoiding hazards such as oil slicks, pits in the road, and of course the posts on both sides. The keys are z-left and m right but are easily changed by altering the values in lines 120 and 130.

Program notes

Lines	
10	Calls a subroutine to initialise the graphics.
15-20	Initialise variables and move the cursor to the screen bottom
30-60	Make up the main program loop the variable E stands for EVENT
100-170	Print and move the road and check to see if anything is hit
200-360	Print a hazard or Print a Pedestrian in which case this routine takes over all functions until the character is off the screen or dead
1000-2000	Set up the graphics (called by line 10)
3000-3030	Print out the score and if wanted will restart the game
5000-5010	Produce squelch sound
6000-6050	Produce skid and explosion sound effects

The program will run on either the unexpanded Vic20 or Vic + 3K

PROGRAM OF THE WEEK

```
10 GOTO1000
15 CLR POKE36878,10 G=0 PRINT"J"
   POKE36979,59
16 CH=0 D=0 SC=0 CA=7680+E*22+11 CO=CA+
   30720 POKE36869 255 POKECA,0 POKECO,0
20 SR=7 POKE782,0 POKE781,22 SYS65520
30 GOSUB100 IFCH=1THENCH=3 GOTO30
40 E=RND(1) IFE<.1THENGOSUB200
60 GOTO30
100 POKECA 32 POKE36874 128+G G=G+1 IFG>
    35ANDRND(1)<.1THENG=-1
105 IFG>55THENG=-1
110 PRINTTAB(SR) "■AA      AA" D=D+.2
120 PR=PEEK(203) IFPR<>33ANDPR<>36THEN140
130 CA=CA-1 CO=CO-1 IFPR=36THENCA=CA+2
    CO=CO+2
140 IFPEEK(CA)=1THENGOSUB6030 GOTO2000
142 IFPEEK(CA)>1ANDPEEK(CA)<10THENGOSUB6000
    GOTO2000
144 IFPEEK(CA)>9ANDPEEK(CA)<19THENGOSUB5000
    SC=SC+(INT(RND(1)*Q+1)*10) P=P1+1 RE
    TURN
150 POKECA,0 POKECO.0
160 X=INT(RND(1)*3)-1 SR=SR+X IFSR=0ORSR=
    12THENSR=SR-X
170 RETURN
200 IFRND(1)<.8THEN250
210 P=INT(RND(1)*4+2+SR) CH=1
220 IFRND(1)<.5THENPRINTTAB(P)"■TBC■■DE"
    RETURN
230 PRINTTAB(P)"■TFG■■HI' RETURN
250 WH=INT(RND(1)*4+1)
255 P=SR+6 P1=SR Z=0
260 PRINT"T"  ONWHGOTO270,275 280 285
270 PRINTTAB(P)"■J■■ ' GOTO295
275 PRINTTAB(P)'■L■M" GOTO295
280 PRINTTAB(P) ■■■" GOTO295
285 PRINTTAB(P)"■F■R'
295 IFZ>0THEN360
300 Z=0 FORL=1TO20
310 GOSUB100 Z=Z+1
320 POKE781,22-Z POKE782,0 SYS65520
340 PRINTTAB(P)'T ■ "
345 IFP=P1+1THENL=20 GOTO360
350 IFL/2=INT(L/2)ANDRND(1)<.7THENP=P-1
    PRINT'T", ONWHGOTO270,275,280,285
355 GOTO260
360 POKE781 22 POKE782,0 SYS65520
370 NEXT
380 RETURN
1000 POKE52,28 POKE56,28 POKE51,0 CLR
1010 FORI=0TO511 POKE7168+1,PEEK(32768+I)
     NEXT
1020 FORI=1TO152
1030 READJ POKE7167+1,J NEXT
1040 DATA126,129,129,255,153,255,195,195,0,
     0,0,24,24,0,0,0
1050 DATA24,126,255,246,107,235,107,43,48,
     124,254,46,108,108,110,111,43,107,118,
     127,255
1060 DATA255,103,2,111,111,34,254,255,251,
     120,56,1,7,15,31,63,38,107,103
1070 DATA128,224,240,248,252,32,118,118,111
     110,63,63,31,15,7,1
1080 DATA118,54,252,252,248,240,224,128,24,
     60,60,60,126,60,24,126
1090 DATA189,189,189,126,60,102,195,102,0,
     0 28,28,15,14,14,62
1100 DATA62,126,125,97 97,225,33,30,0,28,62,
     28,29,12,28,60,92,156,156,148,148,14
     6,182,0
1110 DATA0,0,3,3,1,3,71,203,251,243,243,113,
     169,169,83,0,255,255,255,255,255,255
     ,255,255
2000 GOTO15
3000 POKE36869,240 POKE36874,0 PRINT"J■■■
     YOU SCORED ",SC
3005 PRINT"■■IN ABOUT",INT(D),"MILES
3010 PRINT"■■PRESS ■SPACE■ TO PLAY■AGAIN"
3020 FORDE=1TO1000 NEXT POKE198,0 WAIT198,1
     GETA$ IFA$<>" "THEN3020
3030 GOTO15
5000 FORX=127TO200STEP4 POKE36875,X POKE
     36877,X+15 NEXT POKE36875,0 POKE36877,0
5010 RETURN
6000 POKE36878,15
6010 POKE36077,245
6020 FORDE=1TO3000 NEXT
6030 POKE36878,15 POKE36877 220 FORL=15TO0
     STEP-1 POKE36878,L FORM=1TO200 NEXTM
6035 POKE36879,INT(RND(1)*245)+10 NEXTL
6040 POKE36877,0 POKE36878,0 POKE36879,127
6050 RETURN
```

Death Race
by J Vandersims

OPEN FORUM

Tank Battle

on Spectrum

The program is a Tank Battle-type game in which two players battle against each other to score 15 points. The program is structured as follows

Program notes

10	Defines the graphics
25	Outputs the screen display and sets up an array to contain the positions of the obstacles
60	Starts the main loop in which the direction and whether or not a missile has been launched is determined for each tank
500	Starts the subroutine to output tank one
600	Starts the subroutine to output tank two
700	Starts the subroutine to output any free missiles. Also in this subroutine there are checks to see if an enemy tank, an obstacle or a wall have been hit
1500-1570	Outputs the instructions for the program
1700-1750	Contains the routine for the option to re-run the program

```
   1 REM ***************************
   2 REM ****** © G.SYLAH ******
   3 REM ******  MAY 1983 ******
   4 REM ***************************
   6 LET FIR=0: LET SHO=0: LET D
I=2: LET PO=1: LET DIR=2: LET PO
I=3
   7 LET SCORE1=0: LET SCORE2=0
   8 DIM F(21,32)
   9 GO SUB 1500
  10 FOR G=1 TO 6: READ A$: FOR
I=0 TO 7: READ D: POKE USR A$+I,
D: NEXT I: NEXT G
  20 BORDER 3: PAPER 4: INK 0: C
LS
  25 FOR K=0 TO 31: PRINT AT 0,K
; INK 6;"■": NEXT K
  30 FOR I=1 TO 160: READ D,E: P
RINT AT D,E;"■": LET F(D,E+1)=1:
 NEXT I
  70 LET A$="": LET B$="": LET
X=3: LET Y=11: LET V=11: LET W=
28: PRINT AT Y,X;"";AT V,W; INK
 1;""
  79 PRINT AT 0,0; PAPER 6;"PLAY
ER 1";AT 0,21;"PLAYER 2"
  80 PRINT AT 0,9;SCORE1;AT 0,30
;SCORE2: LET A=X: LET B=Y
  81 IF SCORE1>=15 THEN FOR Q=1
TO 100: NEXT Q: PRINT AT 10,5; I
NK 2; FLASH 1;"PLAYER 1 IS THE W
INNER": GO TO 1700
  82 IF SCORE2>=15 THEN FOR Q=1
TO 100: NEXT Q: PRINT AT 10,5; I
NK 2; FLASH 1;"PLAYER 2 IS THE W
INNER": GO TO 1700
  85 LET X$=("1" AND (IN 63486=2
47 OR IN 63486=243))+("2" AND IN
 64510=247)+("3" AND IN 64510=25
1)+("4" AND IN 65022=251)
  96 IF X$="3" THEN LET X=X-1: L
ET A$="": LET DI=3: IF FIR=0 TH
EN LET DIR=3
  97 IF X$="2" THEN LET X=X+1: L
ET A$="": LET DI=2: IF FIR=0 TH
EN LET DIR=2
  98 IF X$="1" THEN LET Y=Y-1: L
ET A$="": LET DI=1: IF FIR=0 TH
EN LET DIR=1
  99 IF X$="4" THEN LET Y=Y+1: L
ET A$="": LET DI=4: IF FIR=0 TH
EN LET DIR=4
 100 LET C=V: LET D=W
 100 LET Y$=("1" AND (IN 61438=2
54 OR IN 61438=252))+("2" AND IN
 49150=263)+("3" AND IN 57342=25
3)+("4" AND IN 57342=254)
 121 IF Y$="1" THEN LET V=V-1: L
ET B$="": LET PO=1: IF SHO=0 TH
EN LET POI=1
 122 IF Y$="2" THEN LET V=V+1: L
ET B$="": LET PO=4: IF SHO=0 TH
EN LET POI=4
 123 IF Y$="3" THEN LET W=W-1: L
ET B$="": LET PO=3: IF SHO=0 TH
EN LET POI=3
 124 IF Y$="4" THEN LET W=W+1: L
ET B$="": LET PO=2: IF SHO=0 TH
EN LET POI=2
 140 GO SUB 500
 145 GO SUB 600
 150 LET FI=IN 63486=251 OR IN 6
3486=243
 151 LET SH=IN 61438=253 OR IN 6
1438=252
 155 IF FIR=0 THEN LET FIR=FI: L
ET X1=X: LET Y1=Y
 156 IF SHO=0 THEN LET SHO=SH: L
ET V1=V: LET W1=W
 160 IF (FIR<>0) OR (SHO<>0) THE
N GO SUB 700: GO TO 190
 190 GO TO 80
 500 IF X<=0 THEN LET X=0
 510 IF X>=31 THEN LET X=31
 520 IF X>=31 THEN LET X=31
 530 IF Y<=1 THEN LET Y=1
 540 IF Y>=21 THEN LET Y=21
 550 IF F(Y,X+1)=1 OR (X=W AND Y
=V) THEN LET X=A: LET Y=B
 555 IF Y<>B OR X<>A THEN PRINT
AT B,A;" "
 560 PRINT AT Y,X; INK 2;A$
 565 BEEP .01,0
 570 RETURN
 600 IF W<=0 THEN LET W=0
 610 IF W>=31 THEN LET W=31
 620 IF V<=1 THEN LET V=1
 630 IF V>=21 THEN LET V=21
 640 IF F(V,W+1)=1 OR (V=Y AND W
=X) THEN LET V=C: LET W=D
 650 PRINT AT V,W; INK 1;B$
 655 BEEP .01,0
 660 IF V<>C OR W<>D THEN PRINT
AT C,D;" "
 670 RETURN
 700 FOR G=1 TO 3
 701 IF FIR=0 THEN GO TO 870
 702 LET Y2=Y1: LET X2=X1
 710 IF DIR=1 THEN GO TO 750
 720 IF DIR=2 THEN GO TO 760
 730 IF DIR=3 THEN GO TO 770
 740 IF DIR=4 THEN GO TO 780
 750 LET Y1=Y1-1: GO TO 790
 760 LET X1=X1+1: GO TO 790
 770 LET X1=X1-1: GO TO 790
 780 LET Y1=Y1+1
 790 IF X1>31 THEN PRINT AT Y1,3
1; INK 2; FLASH 1;"": LET X1=31
: LET FIR=0: PRINT AT Y1,X1;" ":
 BEEP .01,-10
 800 IF X1<0 THEN PRINT AT Y1,0;
 INK 2; FLASH 1;"": LET X1=0: L
ET FIR=0: PRINT AT Y1,X1;" ": BE
EP .01,-10
 810 IF Y1>21 THEN PRINT AT 21,X
1; INK 2; FLASH 1;"": LET Y1=21
: LET FIR=0: PRINT AT Y1,X1;" ":
 BEEP .01,-10
 820 IF Y1<1 THEN PRINT AT 1,X1;
 INK 2; FLASH 1;"": LET Y1=1: L
ET FIR=0: PRINT AT Y1,X1;" ": BE
EP .01,-10
 821 IF X=X2 AND Y=Y2 THEN GO TO
 826
 824 IF FIR=0 THEN GO TO 870
 825 PRINT AT Y2,X2;" "
 826 PRINT AT Y1,X1;"."
 830 IF F(Y1,X1+1)=1 THEN PRINT
AT Y1,X1;"": LET FIR=0: LET F(Y
1,X1+1)=0: PRINT AT Y1,X1;" ": B
EEP .01,-10
 840 IF Y1=V AND X1=W THEN PRINT
 AT Y1,X1; FLASH 1; INK 2;"": L
ET FIR=0: LET SCORE1=SCORE1+1: B
EEP .01,30
 846 IF V1=Y1 AND W1=X1 THEN PRI
NT AT Y1,X1; INK 2; FLASH 1;"":
 LET SHO=0: LET FIR=0: PRINT AT
Y1,X1;" ": BEEP .01,-10
 850 IF FIR=0 THEN GO TO 870
 870 IF SHO=0 THEN GO TO 1070
 880 LET V2=V1: LET W2=W1
 890 IF POI=1 THEN GO TO 930
 900 IF POI=2 THEN GO TO 940
 910 IF POI=3 THEN GO TO 950
 920 IF POI=4 THEN GO TO 960
 930 LET V1=V1-1: GO TO 970
 940 LET W1=W1+1: GO TO 970
 950 LET W1=W1-1: GO TO 970
 960 LET V1=V1+1
 970 IF W1>31 THEN PRINT AT V1,3
1; INK 2; FLASH 1;"": LET W1=31
: LET SHO=0: PRINT AT V1,W1;" ":
 BEEP .01,-10
 980 IF W1<0 THEN PRINT AT V1,0;
 INK 2; FLASH 1;"": LET W1=0: L
ET SHO=0: PRINT AT V1,W1;" ": BE
EP .01,-10
 990 IF V1>21 THEN PRINT AT 21,W
1; INK 2; FLASH 1;"": LET V1=21
```

```
 LET SHO=0  PRINT AT V1,W1,"  ": BEEP .01,-10
1000 IF V1<1 THEN PRINT AT 1,W1, INK 2, FLASH 1,"%": LET V1=1: LET SHO=0: PRINT AT V1,W1,"  ": BEEP .01,-10
1010 IF W=W2 AND V=V2 THEN GO TO 1040
1020 IF SHO=0 THEN GO TO 1070
1030 PRINT AT V2,W2,"  "
1040 PRINT AT V1,W1,"  "
1050 IF F(V1,W1+1)=1 THEN PRINT AT V1,W1,"%": LET SHO=0: LET F(V1,W1+1)=0: PRINT AT V1,W1,"  ": BEEP .01,-10
1060 IF V1=Y AND W1=X THEN PRINT AT Y,X1, FLASH 1, INK 2,"%": LET SHO=0: LET SCORE2=SCORE2+1: BEEP .01,30
1065 IF V1=Y1 AND W1=X1 THEN PRINT AT Y1,X1, INK 2, FLASH 1,"%": LET SHO=0: LET FIR=0: PRINT AT Y1,X1,"  ": BEEP .01,-10
1070 NEXT G
1080 RETURN
1500 BORDER 1: PAPER 4: INK 0: CLS
1510 PRINT AT 2,10, PAPER 4, INK 2, FLASH 1,"TANK BATTLE"
1520 PRINT AT 4,11,"© G.SYLPH"
1530 PRINT '''" THE AIM OF THE PROGRAM IS TO   REACH 10 POINTS BY ATTACKING    YOUR OPPONENT WITH YOUR TANK"
1540 PRINT ''"THE CONTROLS ARE -",,"              Rt  Lt  Up  Dn  Fi",,"PLAYER 1 'R' 'E' '4' 'D' '3'",,"PLAYER 2 'P' 'O' '8' 'L' '9'"
1550 FOR G=1 TO 100: NEXT G: PRINT AT 21,8,"PRESS ANY KEY"
1560 IF INKEY$="" THEN GO TO 1560
1570 RETURN
1700 FOR G=1 TO 200: NEXT G: BORDER 4: PAPER 4: CLS
1710 PRINT AT 10,4,"DO YOU WANT TO CONTINUE"
1720 PRINT AT 12,13,"(Y/N)"
1730 IF INKEY$="Y" OR INKEY$="y" THEN RUN
1740 IF INKEY$="N" OR INKEY$="n" THEN STOP
1750 GO TO 1730
2000 DATA "a",255,255,28,124,124,28,255,255,"b",255,255,56,62,62,56,255,255,"c",195,219,219,255,255,255,195,195,"d",195,195,255,255,255,219,219,195,"e",0,0,0,24,24,0,0,0,"f",145,82,0,3,64,144,36,66
3000 DATA 1,16,2,7,2,8,2,9,2,10,2,13,2,14,2,15,2,16,2,17,2,18,2,19,2,22,2,23,2,24,2,25,3,3,3,4,3,7,3,8,3,9,3,10,3,22,3,23,3,24,3,25,3,28,3,29,4,3,4,13,4,14,4,18,4,19,4,20
3010 DATA 5,8,5,7,5,13,5,14,5,18,5,19,5,25,5,26,6,6,6,7,6,8,6,10,6,11,6,21,6,22,6,23,6,25,6,26,7,6,7,7,7,9,7,10,7,11,7,12,7,15,7,16,7,17,7,20,7,21,7,22,7,23,7,25,7,26,8,6,8,7,8,12,8,20,8,25,8,26
3020 DATA 9,6,9,7,9,15,9,17,9,25,9,26,10,6,10,7,10,12,10,20,10,25,10,26,11,1,11,2,11,12,11,13,11,14,11,16,11,18,11,19,11,20,11,30,11,31,12,1,12,2,12,8,12,9,12,12,12,20,12,23,12,24,12,30,12,31
3030 DATA 13,8,13,9,13,15,13,17,13,22,13,24,14,3,14,4,14,5,14,27,14,28,14,29,15,3,15,4,15,5,15,15,15,16,15,17,15,27,15,28,15,29,16,8,16,16,16,24
3040 DATA 17,8,17,9,17,23,17,24,18,14,18,18,19,2,19,3,19,18,19,11,19,21,19,22,19,29,19,30,20,2,20,3,20,10,20,11,20,13,20,14,20,15,20,16,20,17,20,18,20,19,20,21,20,22,20,23,20,30,21,16
```

Tank Battle
by Gordon Sylph

Initialise

on BBC Micro

This short program sets up the red user definable keys to produce the colour codes needed for instant colour text on the mode 7 screen without having to use the CHR$ number for the particular colour.

For example control! gives the value 128. Add this to the value of control A (which is one) and you get the total of 129 which equals the colour red.

The *Rem* statements aren't needed and can be omitted.

```
10 REM PROGRAM TO SET UP USER DEFINABLE
20 REM TO PRODUCE COLOUR CODES USED IN
30 REM f0 RED
40 *KEY0 |!|A
50 REM f1 GREEN
60 *KEY1 |!|B
70 REM f2 YELLOW
80 *KEY2 |!|C
90 REM f3 BLUE
100 *KEY3 |!|D
110 REM f4 MAGENTA
120 *KEY4 |!|E
130 REM f5 CYAN
140 *KEY5 |!|F
150 REM f6 WHITE
160 *KEY6 |!|G
170 REM f7 FLASHING
180 *KEY7 |!|H
190 REM f8 STEADY
200 *KEY8 |!|I
```

Initialise
by Neville Jones

OPEN FORUM

Time

on ZX81

Frequently when designing electronic circuits a time delay has to be calculated. This can be tedious if the time has to be converted into hours, minutes and seconds and the conversion has to be repeated several times.

This short program for the expanded ZX81 utilises the ZX81's string handling capabilities in order to calculate the time frequency, time in hours, minutes and seconds from the values of resistance and capacitance entered as they would be written.

The resistance and capacitance can be entered as 220K and 33N rather than converting to 220.000 ohms and 0.000000033 farads respectively. Also resistances can be entered as a calculation, for example several resistors in parallel. This also applies to capacitors. These features can be by-passed and the resistances and capacitance entered as 150 000 ohms etc.

The prefix and time conversions can easily be changed to different units, for example, the time could be extended to days. The print statements could be reduced so that the program will run on the 1K ZX81.

```
  5 REM J.MOULDER,NOVEMBER 1982
 10 PRINT "ENTER TIME CONSTANT"
 20 INPUT A
 30 PRINT "ENTER RESISTANCE(OHMS)"
 40 INPUT B$
 50 PRINT "INPUT CAPACITANCE(FARADS)"
 60 INPUT C$
 70 IF B$(LEN B$)="M" THEN LET B=VAL B$(1 TO (LEN B$-1))*1E6
 80 IF B$(LEN B$)="K" THEN LET B=VAL B$(1 TO (LEN B$-1))*1E3
 90 IF B$(LEN B$)<>"M" AND B$(LEN B$)<>"K" THEN LET B=VAL B$
100 IF C$(LEN C$)="U" THEN LET C=VAL C$(1 TO (LEN C$-1))*1E-6
110 IF C$(LEN C$)="N" THEN LET C=VAL C$(1 TO (LEN C$-1))*1E-9
120 IF C$(LEN C$)="P" THEN LET C=VAL C$(1 TO (LEN C$-1))*1E-12
130 IF C$(LEN C$)<>"U" AND C$(LEN C$)<>"N" AND C$(LEN C$)<>"P" THEN LET C=VAL C$
140 LET D=A*B*C
150 LET F=INT (D/3600)
160 LET G=((D/3600)-F)*60
180 LET H=(G-INT G)*60
200 CLS
210 PRINT AT 0,0,"TIME CONSTANT ",A
220 PRINT AT 1,0,"RESISTANCE ";B$," OHMS"
230 PRINT AT 2,0,"CAPACITANCE ",C$," FARADS"
240 PRINT AT 3,0,"FREQUENCY ",1/D," HZ"
245 PRINT AT 4,0,"TIME ",D
250 PRINT AT 5,0,F," HOURS"
260 PRINT AT 6,0,INT G," MINUTES"
270 PRINT AT 7,0,INT H," SECONDS"
280 PRINT AT 9,0,"[inverse text]"
290 INPUT I$
300 IF I$="N" THEN STOP
310 CLS
320 GOTO 10
```

Time
by J Moulder

Dolly

on Dragon

This program draws a dolly-like shape with various numbers of nodes (corners). Other adaptations give different patterns and shapes as listed below.

Line 20: This line dimensions the arrays that will hold the horizontal and vertical positions of the nodes.

Lines 40 to 60: These lines collect the details of the shape's size, colour and number of nodes.

Line 90: This line gives variable D the number of degrees between each node from the centre of the screen (128,96) and puts the screen high-resolution mode 3.

Lines 100 to 120: These lines make sure the pattern is drawn on a contrasting background.

Lines 140 to 160: These lines set up the position of each node (150 the vertical position, 160 the horizontal position), and place a dot in its place.

Line 170: This line increases the angle variable to separate the nodes.

Lines 200 to 220: These lines draw the design on to the screen.

Lines 230 to 240: These lines hold the pattern on the screen until the space bar is pressed.

	Variations	Description
Variation 1	195 CIRCLE(128,96) R,C	
Variation 2	195 LETS = S/2 200 FOR A = 1 to S 220 NEXT A	Peacock
Variation 3	200 FORA = 1 TO S:LETB = 1 + A 205 IF A = S THEN LETB = 1 220 NEXT A	Outline
Variation 4	205 IF B = A + 1 THEN GOTO 220 207 IF A = 1 AND B = S THEN GOTO 220	Star

```
10 REM FATTERNS BY J. BURR
20 DIMD(360):DIMA(360)
30 CLS
40 INPUT"RADIUS OF THE SHAPE (MAX 96)";R
50 IFR>96THENGOTO40
60 INPUT"COLOUR OF THE LINES (1 TO 4)";C
70 IFC>4ORC<1THENGOTO60
80 INPUT"NO. OF SIDES";S
90 LETD=360/S:PMODE3,1
100 IFC>2THENPCLS2
110 IFC<3THENPCLS4
120 SCREEN1,0
130 FORA=1TOS
140 LETD(A)=96-(R*(COS(D*6.2831853/360)))
150 LETA(A)=128-(R*(SIN(D*6.2831853/360)))
160 PSET(A(A),D(A),C)
170 LETD=D+(360/S)
180 NEXTA
190 COLORC,2
200 FORA=1TOS:FORB=A TOS
210 LINE(A(A),D(A))-(A(B),D(B)),PSET
220 NEXTB,A
230 IFINKEY$<>" "THENGOTO230
240 GOTO30
```

Dolly
by Joseph Burr

Jungle Picture

on Dragon

This program shows a native playing a drum Sitting patiently beside him is his dog I wrote the program to show that the Dragon can produce good animation without having to use *Get* and *Put* The program works by drawing up one picture and then drawing another one Although only three pictures are used, the effect is still pretty good

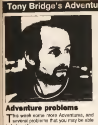
Variables used

B$ Draws the drum
T$ Draws dog in first position
T1$ Draws dog in second position
G$ Draws the ground and shrubs

```
10  REM ***************
20  REM * ANDREW PIDGEON *
30  REM *     6/4/83      *
40  REM * GRAPHICS DEMO  *
50  REM ***************
60  CLS
70  PRINT@166,  THE DRUMMING NATIVE '
80  PRINT
90  PRINT@236,  BY
100 PRINT@206, 'ANDREW PIDGEON
110 FOR DLAY = 0 TO 5000  NEXT
120 PMODE 4,1  SCREEN 1,1  PCLS
130 B$ = " BM110,110 R24 D10 G4 L4 D4, U4,
    L8, O4, U4, L5, H4, U10   REM DRUM
140 T$ = "BM150 128 U1 R2 U2 L3, U2 R3 U1,
    R1 D1 R2 D1 R7, E3, G3, D4, L11'  REM
    DOG IN POSITION 1
150 T1$ =  BM150,128 U1 R2, U3 L3, U2 R2, U1,
    R1, D1, R7, H3, F3, D5 L11 '  REM DOG IN
    POSITION 2
160 G$ = "BM0 128, R20 H4, F4, U4 D4 E4 G4,
    R170 H6, F6, U6 D6, E6, G6, R236   REM
    GROUND & SHRUBS
170 DRAW ' BM120,96 R4, D3, L1 D2 R1 E6, H2,
    E2 F6, G2 H2 G6 D6 R2 D1, L12, U1 R2 U6,
    H6, G2 H2, E6 F2, G2, F6 R1, U2 L1 U3'
    DRAW G$  DRAW B$  DRAW T$  FOR DLAY =
    0 TO 50  NEXT  REM DRAWS FIRST FRAME
180 PCLS  DRAW ' BM120 96 R4, D3 L1, D2, R5,
    F3 E2 F2 G6, H2, E2 H3 D6 R2 D1, L12, U1,
    R2 U6, H6, G2 H2 E6, F2 G2 F6 R1 U2, L1,
    U3  DRAW G$  DRAW B$  DRAW T1$
    SOUND RND(240) 1  FOR DLAY = 0 TO 50
    NEXT  REM DRAWS SECOND FRAME
190 PCLS  DRAW  BM120 96 R4 D3, L1, D2 R1,
    E6 H2, E2 F6 G2 H2, G6 D6, R2 D1 L12, U1,
    R2, U6, G3 F2 G2, H6 E2 F2 E3 R5 U2, L1,
    U3  DRAW G$  DRAW B$  DRAW T$
    SOUND RND(240) 1  FOR DLAY = 0 TO 50
    NEXT  REM DRAWS THIRD FRAME
200 PCLS  GOTO 170  REM CLEARS SCREEN
    AND FLIPS THROUGH FRAMES  PRODUCING
    THE EFFECT OF ANIMATION
```

Jungle Picture
by A Pidgeon

Tony Bridge's Adventure Corner



Adventure problems

This week some more Adventures, and several problems that you may be able to help with

I don't get many letters regarding Commodore 64 programs — this either means that there are not a lot of Adventures available for the machine or that Commodore users are an expecially cerebral lot (unless you know different)! I don't know what the answer is but Bob McClemont has written to me asking for help in *Hitch Hiker's Guide* He can't get past the Great Green Arklessizure! He is also having a problem in *Will o the Wisp* in which the Wizard sends him to sleep and transports poor old Bob to the Room of Sleeping Rocks Is there another Commodore Adventurer who can help him out of his misery?

A little lower down the Commodore scale is the Vic20, and there is no shortage of letters about Adventures for this machine! They are almost always about the Scott Adams series and typical of these is the letter from Dr Raymond Wheeder, of Stoke-on-Trent His wife bought a Vic, and since then family Wheeder has been immersed in Adventure cartridges

The Count is the one that Dr Raymond is currently playing — and he seems to have done quite well too He has worked out that he needs to smoke a cigarette and then lay down in the coffin keeping awake with the No-Doz tablets and keeping a supply of garlic handy The Count proves a bit tricker to catch than that, however and blows out the cigarette before the player can *Zap* him somehow The good Doctor (Wheeder that is!) says that the words *Stairs* and *Roof* are recognised by the program so he knows there are locations that he has not yet seen — can anyone help him find those locations?

The Scott Adams series is also available for the Video Genie and *Strange Odyssey* is giving S J Clark a few headaches Is there life on the other side of the Mining Colony on Jupiter? What is the meaning of the Black Hole? Who are the Novaks? Is it possible to enter the maintenance hatch in the Scout Ship? What is this all about? Please help!

Every Vic adventurer will want to know the answer to the next question Has Scott Adams got any new adventures up his sleeve? Well his company, Adventure International as well as being modest is also extremely rich and a powerful force on the US computer games scene (*Get rich OK* — what next?) they have not got there by sitting on their behinds watching the world go by, and so we can safely assume that they will be working on something

They are also producers of arcade games (the real variety!) and are the authors of "the world's first interactive war arcade game which features sophisticated multi-screen multi-player techniques This is probably the reason for a long silence on the home micro front

As to whether we shall see the *Adventureland* series implemented on other micros depends on the impact of those machines on the US micro scene — the Commodore range are the biggest sellers at the lower end of the market, which is showing some resistance to the Sinclair/Timex machine

In a week or so I shall be looking at Adventure International and the man behind the name

Now another Spectrum Adventure and help needed with *Knight's Quest* from Phipps Associates Several people are flummoxed right from the start in trying to deal with the Dragon This Adventure written by Mike Farley is one in which the player cannot progress one inch without solving the puzzles at each location — no stumbling about, hoping to fall over the solution (and no peeking at the listing either it's all in indecipherable code!) However, everyone seems to want to kill the poor beast on first sight. Just be patient you will indeed have to kill it, but later rather than sooner! For now you should really try and make friends with it.

Other Adventurers are stuck later, having solved the problem of the Dragon Now I haven't had enough time to get too far in this Adventure absorbing though it is so I'd like to hear from anyone who has managed to finish the Quest

Next week I shall be looking at some more from Phipps Associates

Many of your letters ask for a review of a certain adventure and quite often it has already been covered in the Corner So for those of you who are not regular readers of *PCW* below is a list of Adventures so far reviewed

Let's finish on the subject of books about computer adventures To put it simply, there are not many! Butterfield Parker and Honigmann mention the hobby briefly in their school fee supplementing *What Is D & D?* (Penguin) and a brief mention is also made in Ian Livingstone's *Dicing With Dragons* (RKP) but unbelievably the only book devoted entirely to the subject is *Creating Adventure Programs on the BBC Micro* by Ian Watt published by Interface

The book describes how to plan and write your own text Adventure and includes three programs along with hints on how to play the Adventures As many letters I receive ask where books on the subject may be obtained there would seem to be a demand

The aforementioned Ian Livingstone, together with Steve Jackson (both highly-respected names in the gaming (D & D dept.) world) has produced a series of books for Puffin, which although not computer adventure books may well be of interest The series begins with *The Warlock of Firetop Mountain* and takes the form of solo Adventures

With the aid of two ordinary dice and pencil and paper, the player works through the book, taking decisions at each turn of the page on where to go next Good pictures and a nice touch of humour make these books rather interesting

Finally If you are one of the many stuck at the final gate in *Pimania* and wondering how to open it — think about the title and do a little mathematical cogitating ■

3 March	*The Hobbit*	(Melbourne House)	Spectrum
24 March	*Perilous Swamp Sorcerer's Island*	(Pslen)	ZX81
17 March	*Ghost Encounters Action Quest*	(JV Software)	Atari
28 April	*Knight's Quest*	(Phipps)	Spectrum
12 May	*Colossal Adventure*	(Level 9)	
19 May	*Sorcerer's Castle Mad Martha 1*	(Microgen)	Spectrum
26 May	*The Valley*	(Kayde Asp)	
9 June	*Volcanic Dungeon*	(Carnell)	ZX81/Spectrum
16 June	*Pharoah's Curse*	(Synapse)	Atari
	Journey to the Planets	(JVS)	Atari
30 June	*Castle of Death*	(Electra)	
	Castle of Doom	(Spacsoft)	
	Magic Castle	(Gilsoft)	Spectrum
7 July	*Ring of Darkness*	(Wintersoft)	Dragon
21 July	*The Hobbit (Part 2)*		
28 July	*Velnor's Lair*	(Quicksilva)	Spectrum
4 August	*Madness and the Minotaur*	(Dragon Data)	Dragon
18 August	*White Barrows*	(ASP)	Spectrum
25 August	*The Hobbit (Part 3)*		
And finally			
23 June	*The Top Eight*	(in need of an up date — let me know your top favourites)	

This series of articles is designed for novice and experienced Adventurers alike Each week Tony Bridge will be looking at different Adventures and advising you on some of the problems and pitfalls you can expect to encounter So if you have an Adventure you want reviewed or if you are stuck in an Adventure and cannot progress any further write to Tony Bridge Adventure Corner *Popular Computing Weekly* 12-13 Little Newport Street London WC2R 3LD



PCW BINDER

N Hamer of Buttermere, Greenways Spennymoor, Durham writes

Q **I have bought *Popular Computing Weekly* since March and have found it very helpful and interesting. However, as my collection of magazines is growing rapidly, I very much need a binder of some sort to store them Do you have anything to offer? If so, how much does it cost and where do I obtain one?**

Also, my Spectrum has been acting very strangely recently and a local computer club has suggested that it could be the recent heatwave. Do you know if any other readers have had a similar problem?

A This is a problem that we do not at the moment have a real answer for There are a few requests for binders, but not enough to make it worthwhile for us to get some specially made

However a friend has just pointed out that W H Smith carry magazine binders for 24 magazines though apparently they are not in all branches of Smiths

As for your question about your Spectrum well I blamed the weather a few weeks ago when the same thing happened to me, but in all honesty, I do not know

---

Continuing my policy of Quickies I have been following over the last few weeks, here are some for the Spectrum

D Marsh of Theydon Bois wants to know how to test the size of the memory on his Spectrum Ben Jenkins of Wallasey wants to know the same B Walton of Whitley Bay knows the answer, but just wants to check if he is right

You can do this either by looking at Ramtop which is situated almost at the limit of the memory, or else by entering a *Dim* statement such as *Dim A$ (1024 40)* This asks the computer to set aside an area 40K large which is of course not possible on a 16K computer

F Bennet of Rotherham, Paul Slack of Burton-on-Trent, and someone whose name I cannot read from Nantwich in Cheshire all want to know where they can get a monitor for their Spectrum

The Spectrum has a non-standard video output The only monitor that I know of which has an additional special interface for the Spectrum is a full colour model from Microvitec The cost is £274 + VAT and Microvitec are at Futures Way, Bolling Road Bradford BD4 7TU

To end with both H Harvey of Three Bridges and Michael Royle of Blackburn are seeing squares on their televisions after using their Spectrums for a while H Harvey says he has an issue one model I wonder if Michael does as well From your letters, I would say that your computers are crashing because of overheating There is nothing you can really do except return them under the guarantee

SINGLE PACKAGE

J Gurney of Saxilby near Lincoln writes

Q **Now that the Commodore disc drive is cheaper than when it was first announced, I am thinking of getting one in a single package with my Commodore 64, to which I am treating myself within the next couple of months I understand that it is compatible with the 64, but a few changes have to be made. What changes and is a special interface necessary?**

A The Vic-1540 is an intelligent drive with its own Rom and 2K of Ram The only change needed is with the Rom The Vic Rom chip will have to be changed for a Commodore 64 compatible chip It has its own 6502 chip onboard, which means it can format discs while the computer is getting on with other tasks and of course the Dos is onboard as well

As long as you ensure that the correct Rom is onboard then you should have no problem and it would make a very powerful home system to buy in one go

DRAGON FORTH

David Freeman of Buckhouse Drive London N16 writes

Q **I know there is a disc version of Forth for my Dragon, but I have not got a disc drive. Do you know if there is a cassette based version available somewhere?**

A Oasis Software of Lower North Street, Cheddar, Somerset, produce a cassette version of Forth It costs £18 95, and is a variant of Fig Forth The language is on one side of the tape and a demonstration program on the other It also includes a comprehensive manual

OBSOLETE VIC?

A A Morris of Woodward Road Bury, writes

Q **Please tell me I am wrong I chose to buy a computer just a few weeks ago So, after taking the salesman's advice and counting my pennies, I bought a Vic20 at £139 50 Since then I have heard that the top five software houses are going to stop, or have stopped writing programs for it I was thrilled at first, but now I feel conned Please tell me and 185,000 other Vic owners that we are not going to become an endangered species.**

A I remember being flooded by similar letters when the ZX Spectrum was launched and all the ZX81 owners wanted to know whether or not they would be forgotten That was a year ago Anyone who went to the last ZX Microfair would know that the ZX81 is still very much alive and kicking The reason for this, and why I expect a similar situation with the Vic is answered in your letter — 185,000 owners!

While I do not think that the Vic will engender the depth of response that the ZX81 has I cannot see how the Vic can be written off If you are happy with your computer, why worry? There are so may programs already for the Vic that I cannot envisage a software famine

The only thing that might be worrying is what were you told by the assistant? If you were told that the Vic was the latest model then you were misinformed

64 COMPILER

Harry Mellish of Killearn Scotland writes

Q **I have had a Commodore 64 for a few months and find it much better than the Vic I used to have I always meant to get a compiler for my Vic, but never did**

But, now I am thinking of getting one for my Commodore 64. I had pretty much decided on what to get when a friend reminded me of something we had both seen a few months ago — an optimising compiler All I can remember was that it was for the 64 and very expensive. Do you know anything about this? I plan to keep this computer for some time, so if it is worth getting I will

A An optimising compiler not only compiles but also tries to do it more efficiently Naturally, if the code is compiled more efficiently and compactly, then it will run quicker

The only such compiler I have seen for the Commodore 64 is Petspeed and costs £125 You were right when you said that it was expensive However, it comes with a security 'dongle' and has a few additions to Pet Basic in that it allows the use of long named variable, and extends the *Def Fn* to include String handling

Petspeed can be purchased from Oxford Computer Systems Woodstock Oxford

Is there anything about your computer you don't understand, and which everyone else seems to take for granted? Whatever your problem *Peek* it to Ian Beardsmore and every week he will *Poke* back as many answers as he can The address is *Peek & Poke*, *PCW*, 12-13 Little Newport Street, London WC2H 3LD

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NEW RELEASES

JEEPERS



Despite its lack of memory, people are still buying the Vic20 Presumably, having bought it they are sticking with it and buying add-ons for extra memory Most of the new games I've seen require at least 3K expansion — maybe because of the need to compete with some of the spectacular Spectrum programs

Creepers requires an additional 3K and is one of Virgin's recent releases You control a space ship which you can move up and down and turn to face different directions

Your task is, as ever, to blast away the little aliens that bounce up and down in front of you (and sometimes behind you) Although usually they take their punishment like men (well, like aliens), sometimes they rush for you and you must quickly move your spaceship out of the way

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DEATH STARE

The latest releases from Phipps Associates are not adventures — bad news for addicts of *Knights Quest* and *Magic Mountain*

Instead *Black Planet* and *Gorgon* written by Barry Cornhill of the Aylesbury Computer Club, are what you might call multi-state arcade games *Black Planet* has nine stages through which you must pass before you can destroy the *Black Planet* (and get a free badge)

Gorgon is set in ancient Greece — as Spectrasses you must fight Grang and return a stolen chalice to its rightful home

There are two sections to the game firstly you fight off the Gorgon (Grang's friend) by reflecting his death-dealing stare back at him/her/it

Assuming you manage this, there follows a sword fight with Grang You can parry thrust, advance and retreat to try and score as many hits as you can All this within a time limit because (oblivious to the merits of the case) the Gods have decided to destroy your town by flood unless the chalice is returned

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ENERGY



Knowing quite what to say about *The Oracle's Cave* is not easy but one thing seems clear — it is the closest yet to a true animated graphic adventure and is excellent value for money

Like most adventure games there are secret passages to be discovered and monsters to be fought but in this program you direct a little man who moves, fights, etc, according to your instructions

If, for example there is a cave with a rope in it and you type *u* for up the little man jumps up and climbs the rope The effect is startling at first

Like other adventures you have to pay attention to things like combat energy and will have to rest if it starts to fall but the whole quest has a time limit of five days, and resting (or any other action) uses up precious hours

Hardened adventurers may feel limited by the single key instructions — no guessing the right words here, but the range of options is still more than I've seen on many text-only adventures

At £7 95 it makes some adventures (particularly on other micros) look silly

Program *The Oracles Cave*
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FUNCTIONS

Compusense has built a good reputation with its range of cartridge based utilities for the Dragon

The latest addition to the range is *Edit +* a full screen editor for program development

Existing Basic commands are uneffected, but various new functions are added, including up and down scrolling specific line *Goto* and find string

The program is designed to be simple to use It incorporates the hi-res 51 × 24 screen program within it (a separate manual is provided) and so retails for a whopping £34 50

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HEX DUMP

The *Exmon* monitor which has been available for quite a while on tape is now available on Eprom

The Eprom version has a number of extra features There are register displays and alteration with disassembler, hex dump and save to file

Other features include a relocator, and single step tracing of program *Exmon* is particularly designed for debugging machine code programs and can be included within source code

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PRICE DROP



Virgin Games will be hoping to improve its reputation with its latest batch of games

Regarding Virgin's Spectrum releases at least, critical opinion was decidedly negative on the company's first offerings

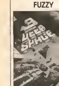
There are two Spectrum games this time one is a puzzle called *Lojix*, the other is *Racing Manager*

The latter seems to be an equine version of *Football Manager*, involving both making decisions about what to spend and graphics of the actual horse race itself

Looking at the game only briefly, I have to say that graphically it is poor The selection routines for horses, odds, etc look slow, although it is apparently written in machine code Virgin has, however dropped its prices from £7 to £5 95 for Spectrum games which is certainly welcome news

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FUZZY



3D programs are nothing new, though the 3D effect has varied from terrible to a grudging not bad. Postern has adopted a different approach.

With *3 Deep Space* by Mike Singleton comes a free pair of 3D glasses. Without them the program looks fuzzy and out of focus; with them full 3D effects.

The game itself sounds like the standard space extravaganza with baddies that swoop not only up and down but also in and out of your TV screen.

From reading the blurb on the cassette it seems that a reasonable quality television will be necessary for good results since you have to fine tune the colour/intensity for best results.

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TWITCH

Identikit is an educational program from Stell Software. I'm not sure exactly how it is educational but it is quite good fun.

You design a face from a choice of bits, various noses, eyes, etc. Once you have a face you like, it can be saved on tape.

Most of the results are comical and use big graphic shapes. Once the face is finished there is what might be termed a twitch option where you can get eyes to blink, noses to wrinkle, ears to wiggle or (most dramatically of all) everything moving at once.

Program *Identikit*
Price *£5.95*
Micro *Spectrum 48K*
Supplier *Stell Software, 36 Limfield Avenue, Whalley, Lancs BB6 9RJ*

ATTACKED

No prizes for guessing the arcade parentage of *Defend the Cities* from Intersoft.

Missile Command (for this is it) is a game in which you defend three cities from repeated attacks. You must destroy not only the bombs as they fall, but also the aircraft which are dropping them.

There are two versions of the Game, one in extended Basic and another in machine code for the mini memory module. Extensive notes come with both versions.

Program *Defend the Cities*
Price *£14*
Micro *TI99/4A (Extended Basic MMM)*
Supplier *Stainless Software, 10 Alstone Road, Stockport, Cheshire SK4 5AH*

DIGGER



Paul Johnston author of Hard Cheese by DK Tronics

Hard Cheese is a sort of *Dig Dug* (the celebrated arcade game) in which you guide your digger around a field running away from the standard funny creatures who commonly inhabit such games.

The significance of the cheese may not be immediately apparent but if you eat it there is a charming rendition of "We plough the fields and scatter".

Killing all the monsters on each frame either by shooting them or dropping what look like cherries, gets you on to the next frame.

Program *Hard Cheese*
Price *£5.95*
Micro *Spectrum 16/48K*
Supplier *DK Tronics, Unit 2, Shire Hill, Industrial Estate, Saffron Walden, Essex CB11 3AX*

ALIEN SHIPS

The newest addition to the growing number of software houses offering One programs is Express Software. Among its releases is *Space Quest*.

The earth is being destroyed by bombs from alien ships orbiting the earth: your job is to encourage the aliens ... oh, all right I'm sorry: your job is to stop the aliens at all costs by detonating the bombs while they fall.

Program *Space Quest*
Price *£5.95*
Micro *Oric 1 16/48K*
Supplier *Express Software, City Gate, 25 Moat Lane, Birmingham B5 6BH*

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COMING SOON

Like many of the mythical Greeks, Perseus had a hard time of it because of an Oracle.

The ancient Greeks instead of reading their horoscopes in the daily paper listened to Oracles who usually predicted dire events.

Perseus adventures may be more familiar than you think since the myth formed the basis of *Clash of the Titans* — the most recent Ray Harryhausen film.

To cut a long story short, Perseus can win a homeland and a bride if he can return with the head of Medusa.

Now you can live out the myth as an adventure game complete with Medusa, the lovely Andromeda, various challenges and quests along the way — and garish graphic illustrations at each point.

Aside from the pictures, it is also claimed that the program understands full sentences, eg, "Pick up the sword and go north" like *The Hobbit*. Could be good for Christmas. The programs will be available for the Commodore 64 and the Spectrum (48K).

New Releases is designed to let people know what software is coming on to the market. If you have a new game or utility which you are about to release send a copy and accompanying details to New Releases, Popular Computing Weekly, 12-13 Little Newport Street, London WC2R 3LD.



Ziggurat



Home education

More computer education happens in the home than occurs in schools or colleges

With over a million computers in British households (far more than there are in the education system) we have to concentrate on the importance of the home

Whereas in educational circles the BBC computer is supreme in the home the Spectrum is king More computer education happens through the soggy keyboard of a Spectrum than through any other regardless that schools support the BBC And it looks as if this imbalance between the official and unofficial education will become worse

The Spectrum is successful because it fulfils a need not because someone said they have to use it (not that I am knocking the BBC machine — in fact I prefer it)

The same is true of software I started to think — always a dangerous sign — what is it that puts Logo Forth C and Basic into one group and Algol and Pascal into another group?

The answer is that Logo and the others became successful because of the pressure from satisfied users

Basic became such a successful language because it allowed real people to do what they thought they wanted to do When ordinary Basics stop doing what people want to do and as other easily used languages become available Basic will become less popular If Basic withers and dies It will be because users have found a better alternative

At a recent meeting I attended of the British Logo Users Group (BLUG) there were hundreds of people They came not because of some commercial pressure but because they found that Logo actually did what they wanted it to do

C and Unix, are now commercial successes But successful because of the numbers of satisfied users who found both worked and worked well

In contrast Algol (60 and 68)) and Pascal have never been successes And never will be apart from in education because they were imposed from above Once outside education , the languages were found so unhelpful that they are resounding tinkles

Personally I think that many home users will stop using ordinary Basics and will move over to using Logo and (a lesser number) Forth because they are both languages which do more and are fun to use One of the few Basics to remain may well be BBC Basic but then it is rather unlike many more traditional versions

Forth is now available for most machines (with implementations of varying excellence) and shortly good versions of Logo will be available for most computers I know there will be versions of Logo available (by Christmas) for the Apple Atari Commodore 64 IBM PC Research Machines Sinclair Spectrum and TI-99/4a (a new version)

Note that there is no BBC version likely for some time yet — so schools who have chosen the BBC computer are being deprived of a full version and will have to use stop gaps

If the school has a Research Machines computer then there will be a version of Logo available but a version so different from any other that it might not be classed by some as a Logo

Schools with Spectrums will soon be able to obtain copies of Logo A very good version it is too written to the standard of the US implementations

By restricting the choice of micros in schools to the three manufacturers with Sinclair being a grudging addition the Department of Industry has placed schools in a bit of a quandary Logo cannot be used on most schools micros

I always did think that the DoI scheme was a waste of money especially given the silly restriction on choice And look what has happened There was much gnashing of teeth and pulling of hair from schools because Acorn were going to be so late with Logo

Yet education in the home has not been affected All those Apples Ataris TIs Commodores and IBM PCs will soon have (or already have) a Logo implementation A great language and much fun

So will the overwhelming majority with Spectrums.

Boris Allen

Puzzle

Evening walk

Puzzle No 75

We were out walking the other evening from Longfield to Northbridge As you can see from the map Longfield is exactly one mile due west of the troll s crossroads and Northbridge three-quarters of a mile due south of it.



After walking along the road for some time we decided to cut across the heath and make straight for the Northbridge church spire

If we can walk at a steady four miles per hour along the road but only three miles per hour across the rough heath at which point (to the nearest yard) should we leave the road in order to arrive at Northbridge the quickest?

Solution to Puzzle No 70

For a triangle to exist, the sum of the length of the two shorter sides must be greater than the length of the larger side In the program successively large triangles are constructed with this fact in mind Note that the area of any triangle is given by the formula

$A = \sqrt{S(s-a)(s-b)(s-c)}$

where *a*,*b* and *c* are the sides and *s* is equal to half the perimeter $(a + b + c)/2$

In the program *T* is the count and stops when it reaches four *C* always represents the largest side and *A* the smallest.

10 LET T = 0 **20** LET C = 1 **30** FOR B = 1 TO C **40** FOR A = 1 TO B **50** IF B + A<= C THEN GOTO 90 **60** LET S = (A + B + C)/2 **70** LET AREA = VAL STR$ (SQR(S*(S − A)*(S − B)*(S − C))) **80** IF AREA = A + B + C THEN GOSUB 200 **90** NEXT A **100** NEXT B **110** LET C = C + 1 **120** GOTO 30

The sides and areas/perimeters of the four smallest triangles are (in yards and yards/square yards)

6 8 10 and 24
5 12, 13 and 30
9 10 17 and 36
7 15 20 and 42

There are in fact only five triangles possible these four and the fifth and largest with sides six, 25 and 29 yards

Winner of Puzzle No 70

The winner is Steve Parker Greenpark Avenue Skircoat Green Halifax West Yorks who receives £10

Top 10

Atari

1 (—) Ultima II (Sierra On-line)‡
2 (4) Paris In Danger (Avalon Hill)‡
3 (—) Zork I (Infocom)§
4 (8) Diamonds (English)
5 (—) Night Raider (TG Products)
6 (—) Preppie (Adventure International)
7 (—) Flying ace (Avalon Hill)
8 (1) Miner 2049er (Big Five)
9 (—) Arcade Machine (Broderbund)‡
10 (10) The Bests of Blackpoole (Bestel)

*Cartridge †32K cassette §32K disc ‡48K disc.

(Figures compiled by Calisto Computers, Birmingham 021-632 6458)

ZX81*

1 (3) Flight Simulation (Psion)
2 (4) Football Manager (Addictive Games)
3 (2) Space Raiders (Psion)
4 (6) QS Scramble (Quicksilva)
5 (—) Planetoids (Psion)
6 (5) Fantasy Games (Psion)
7 (8) Defender (Quicksilva)
8 (10) Ship of Doom (Artic)
9 (7) Asteroids (Quicksilva)
10 (9) Espionage Island (Artic)

*All run in 16K

(Figures compiled by Boots & Co London)

Dragon

1 (1) The King (Microdeal)
2 (2) Frogger (Microdeal)
3 (3) Talking Android Attack (Microdeal)
4 (5) Night Flight (Salamander)
5 (4) Space War (Microdeal)
6 (6) Ring of Darkness (Wintersoft)
7 (10) Dragon Trek (Wintersoft)
8 (7) Planet Invasion (Microdeal)
9 (9) Menneco Grand Prix (Microdeal)
10 (8) Quest (Dragon Data)

(Figures compiled by Boots & Co Limited)

BBC*

1 (—) Hopper (Acornsoft)
2 (—) White Knight Mark II (BBC Soft)
3 (—) Dr Who — The First Adventure (BBC Soft)
4 (8) Atari Swirl (Program Power)
5 (4) Starship Command (Acornsoft)
6 (3) Felix in the Factory (Program Power)
7 (2) Danger UXB (Program Power)
8 (5) Centipede (Superior)
9 (6) Snooker (Acornsoft)
10 (8) Great Britain Limited (Simon W Hessel)

*All Model B only

(Figures compiled by Micro Management Ipswich 0473 59181)

Spectrum

1 (3) Jet Pac (Ultimate)
2 (1) Trans Am (Ultimate)
3 (9) Scrabble (Psion)*
4 (2) The Hobbit (Melbourne House)
5 (6) Horace and the Spiders (Psion/Melbourne House)
6 (5) Flight Simulation (Psion)
7 (8) Ah Diddums (Imagine)
8 (7) 3D Tanx (DK'Tronics)
9 (—) Chess (Psion)
10 (—) Cookie (Ultimate)

*Requires 48K

(Figures compiled by W H Smith and Son London)

Books

1 (1) Structured Programming with BBC Basic *Atherton* (Horwood)
2 (6) Basic Programming on the BBC Micro *Cryer* (Watford Hall)
3 (—) The BBC Micro An Expert Guide, *James* (Granada)
4 (4) Complete Spectrum Rom Disassembly *Logan and O'Hara* (Melbourne House)
5 (—) The BBC Micro Book Basic Sound and Graphics, *McGregor and Watt* (Addison Wesley)
6 (2) Commodore 64 Programmer s Reference Guide *Commodore* (Commodore)
7 (8) Anatomy of the Dragon *James* (Sigma)
8 (10) Spectrum Hardware Manual *Dickens* (Melbourne House)
9 (7) Commodore 64 Machine Code Master *Lawrence and England* (Sunshine)
10 (—) 36 Challenging Games for the BBC Micro *Hartnell* (Interface)

(Figures compiled by Watford Technical Books Watford 0923 23324)

(Last week's position in brackets)

Vic20

1 (1) Androids (Imagine)
2 (2) Wacky Waiters (Imagine)
3 (3) Sky Hawk (Quicksilva)
4 (7) Grid Runner (Llamasoft)
5 (5) Catcha Snatcha (Imagine)
6 (4) Cosmiads (Bug-Byte)
7 (—) Escape MCP (Rabbit)
8 (6) Cosmic Cruncher (Commodore)*
9 (9) Frantic (Imagine)
10 (10) Palac (Bug-Byte)

*Cartridge

(Figures compiled by Boots & Co, London)